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To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interests of Lake Carriers, and improve the character of the service rendered to the public.

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## EVOLUTION OF THE MODERN WARSHIP.

An exceedingly interesting and instructive paper on the evolution of the modern warship was read at the seventy-fifth anniversary of the Franklin Institute, Philadelphia, last week, by Rear-Admiral George W. Melville, Engineer-in-Chief, U. S. N.

After briefly describing the modern warship as the complete fruition and triumph of many branches of the great science of engineering, the author called attention to the fact that the first steam war vessels in the world was built for our navy. Not only that; it was designed by Robert Fulton, who first made steam navigation practicable; and its construction antedated the founding of the Franklin Institute by only about ten years.

This first vessel was called the Demologos, or Fulton the First, and while of what would now be considered very small dimensions, was, nevertheless, a wonder of the period. She was 156 feet long, 56 feet beam and 20 feet deep, measuring 2,475 tons, having a single water wheel in a central well, and capable of steaming about six knots. The battery comprised 20 guns of the largest size at that date, a number of them having been taken from a captured British vessel. The hull, of course, was of wood, and the boilers were of copper. She was not completed until just after the termination of the war of 1812, so that she never saw any active service, and was blown up by an explosion of her magazine in 1829.

The next steam war vessel, also called the Fulton, and completed in 1837, was somewhat longer than the first Fulton, but with less beam, and proved a very successful ship for the period, being capable of steaming 12 knots an hour under favorable conditions. A most interesting thing in connection with this old vessel is the fact that the enginee who designed her machinery and superintended its erection became her chief engineer when she was commissioned, and thereby became the first engineer in the United States Navy. This distinguished gentlemon, Chas. H. Haswell, is still alive, and in the active practice of his profession. He is widely known among mechanics as the author of Haswell's Pocketbook.

After the building of the Fulton, steam vessels were added to the navy at regular intervals, each class marking the improvement on the preceding ones, until shortly before the beginning of our Civil War we had a class of frigates which in ordnance, machinery and hull were justly considered the finest in the world.

With the coming on of the Civil War, the evolution of the modern war vessels began. One of the problems for the engineer-in-chief at this time, Benjamin F. Isherwood, was the construction of machinery which should be thoroughly trustworthy in the hands of men of very limited experience. This led him, contrary to what would ordinarily be considered good designing, but which, under the circumstances, was consumate engineering skill, to build machinery very heavy, but which, as a matter of fact, never broke down and which carried our guns to victory. In those days, just as in our own, the "man behind the gun" may be most in evidence, but without the man "behind the shovel" he would never have been able to get within range of the enemy.

The destructive career of the Alabama suggested and enforced the building of a class of vessels which should be faster than any others afloat. As the material of the hulls was then still wood, giving a platform altogether too flexible to permit of the type of engines now used. Isherwood designed what were known as geared engines, which he, better than any one else, knew were extremely heavy, but the great point is that they enabled him to accomplish exactly what he set out to do. The Wampanoag, the first of these vessels, in 1868, made the unprecedented record of nearly 17 knots for 36 hours in a rough sea, and for several periods of 6 hours 17½ knots. At that time no other vessel in the world, either war or merchant steamer, approached this speed within three knots.

About this time Mr. Isherwood conducted a number of experiments in connection with the expansion of steam, and boldly enunciated principles which the rest of the engineering world in many cases denounced as erroneous, but which are now accepted as fundamental facts in thermo-dynamics. This is notably the case with respect to cylinder condensation, where he was the first to enunciate the true principle.

Another great engineer became famous at this time, although he had been doing splendid work and helping to develop the war vessels before, namely, Capt. John Ericsson. The story of the first monitor is too well known to require more than incidental reference. Coincidentally, much was done for our ordnance during this period by Admiral Dahlgren, so that at the end of the war our naval guns were recognized as the best in the world.

Following the war, and up to 1883, there was a period devoid of important developments in naval construction, as we were not building anything new in ships, guns or machinery. But with the beginning made in that year in the creation of the White Squadron, the march of improvement was again taken up.

## HUDSON'S BAY.

A. P. Low, of the Geological Survey of Canada, has returned to Ottawa, after fifteen months' exploration of Hudson's Bay. Mr. Low left Ottawa in the spring of 1898, for the Atlantic coast, from whence he went by steamer to the eastern mouth of Hudson's Straits, where he took a yacht and explored the coast down to Great Whale river, a part of the bay not previously explored. Several large rivers were discovered, and great quantites of fish were found, especially in the mouths of the rivers. The fish found were Arctic salmon, whitefish, trout and cod. Mr. Low thinks that they are in sufficient quantities to make fishing for commercial purposes very profitable. The winter of 1898-99 was spent in Great Whale river, Mr. Low and his party living in snow houses. There was not much work done during the winter, as there was barely six hours sunlight a day; but during the past summer a very large tract of country inland was explored, and some valuable mineral discoveries made, of which details will be given in his report to the Government, which will be made at an early date.

## TRANS-ATLANTIC STEAMSHIPS.

The president of the Mechanical Science Section of the British Association, Sir William White, in his presidential address paid attention chiefly to developments in steam navigation, and, speaking of the trans-Atlantic service, said:

"Sixty years of continuous effort and strenuous competition on this great 'ocean ferry' may be summarized in the following statement: Speed has been increased from 8½ to 22½ knots; the time on the voyage has been reduced to about 38 per cent. of what it was in 1840. Ships have been more than trebled in length, about doubled in breadth, and increased tenfold in displacement. The engine power has been made forty times as great. The ratio of horse-power to the weight driven has been increased fourfold. The rate of coal consumption (measured by horse-power per hour) is now only about one-third what it was in 1840. To drive 2,000 tons weight across the Atlantic at a speed of 8½ knots about 560 tons of coal were then burned; now to drive 10,000 tons across at 22 knots about 3,000 tons of coal are burned. With the low pressure of steam and heavy, slow-moving paddle engines of 1840, each ton weight of machinery, boilers, etc., produced only about 2 horse-power. With modern twin-screw engines and high steam pressure each ton weight of propelling apparatus produced from 6 to 7 horse-power. Had the old rate of coal consumption continued, instead of 3,000 tons of coal, 9,000 tons would have been required for a voyage of 22 knots. Had the engines been proportionately as heavy as those in use 60 years ago, they would have weighed about 14,000 tons. In other words, machinery, boilers and coals alone would have exceeded in weight the total displacement of the Campania as she floats to-day. There could not be a more striking illustration than this of the close relation between improvements in marine engineering and the development of steam navigation at high speeds."

## NAVY ITEM.

The Navy Department has substituted the Ranger for the Badger as one of the reinforcing fleet for the Phillppines. The Badger was found to require repairs so extensive as to make it impossible for her to get off for some time. The Ranger is just out of the navy yard and is in excellent condition. She has not yet been put into commission, so the department has given orders for the transfer to her of the entire personnel of the Badger, from Captain Miller down to the enlisted men.

The Machias has sailed from Alexandria for Boston, there to fit out for Manila. The Marietta which is also under orders for the same place, is at Lambert's Point taking on coal. The Nashville sailed on Sunday from San Juan, P. R., for Gibraltar, bound for Manila, and is the first of the reinforcing fleet to get off.

The hospital ship Missouri, en route from New York to Manila, has reported to the War Department from Gibraltar, all well on board.

AN electric fog horn has been invented by a Canadian engineer. A naphtha engine supplies the motor power for a dynamo, which furnishes the electric current by means of which three pairs of electro-magnets operate half a dozen clappers, which strike against a large gong with the frequency of about 36,000 strokes to a minute, producing an almost continuous sound. Its effectiveness is enhanced by a mechanism on the principle of a megaphone, by means of which the sound is not only intensified, but thrown in the required direction. According to The Western Electrician the sound from a small model was heard a distance of two miles. A full-sized fog horn is to be sent to the British Columbia coast, where it will be installed and put in operation at once.

## CHICAGO.

*Special Correspondence to The Marine Record.*

Grain freights have been strong at 3½ cents all week for corn. A slight advance is now looked for, and a broker mentioned to me that about ¼ cent better might prevail by the end of the week.

The dredging in the Calumet river has progressed from One Hundred and Sixth to One Hundred and Tenth street. Work is continuing steadily and it is estimated that One Hundred and Sixteenth street will be reached before the close of navigation.

Western agent George J. Harris, of the Canada Atlantic line, said that no farther progress had been made in the negotiations for additional boats for his line. It was reported from Cleveland that the Penobscot would probably be added to the Canada Atlantic fleet.

The Phenix Steamship Co. has changed officers as follows: President, Charles E. Kremer; vice president, F. T. Bentley; secretary, W. J. Rardon; treasurer and manager, J. J. Rardon. Capt. James Davidson, of Bay City, retires from the company, having sold his interest.

W. H. Cook, of this city, who bought the steamer Cleveland shortly before she sunk, has sold her to William Moeller, the big dealer in cedar. The Cleveland left here Tuesday evening in charge of her new owner, and will be used in the cedar trade during the balance of the season.

The winter session of the Chicago Nautical School opened October 1. The school starts its sessions with pupils from the Atlantic coast, and one from Texas. A sailor on the Pacific coast has signified his intention of joining the school at a later date, taking the nautical course by mail.

Mr. H. F. J. Porter, M. E., will deliver a lecture, illustrated by stereopticon views, on "The Position of Forging in the Arts," on Thursday, October 19, at 8 o'clock p. m., before the Political Economy Club of The University of Chicago, in the Lecture Hall of the Haskell Museum.

S. S. Burke, owner of the steamer Lawrence, is in Milwaukee looking for a steamer to run in connection with the Lawrence, on the Milwaukee-St. Joseph course. He is attempting to secure a single deck steamer with space enough between decks for a general cargo, and the building of cabins for passengers.

After being repaired to the extent of $1,500 the steamer Cleveland has been put into service again. She has been in the Miller dry dock since sinking at the mouth of the river a month ago. Some new planking in her bottom and liberal calking comprised the greater part of the repairs that have made her again lakeworthy.

Rush street bridge is being thoroughly repaired and put in shape to take care of the immense amount of traffic that pours over it daily. It is estimated that it will take another fortnight to complete the repairs according to the scale decided on. The roadway was in bad condition and often caused delays in both river and street traffic.

General Manager Bird, of the Chicago, Saugatuck and Douglas line, has returned from the east, where he has been examining all the lake steamers available for an addition to the Chicago-Saugatuck service next year. The steamer Pennsylvania, which was also sought by the Graham & Morton line, was one of the boats on which an offer was made.

Lake receipts of coal in Chicago during September, according to the report of the bureau of coal statistics, were 60,000 tons less than during September of last year. Rail receipts, however, gained 70,000 tons over the rail movement of a year ago, thus making a net gain for the month of 10,000 tons in the city's coal receipts. Total anthracite stocks here are estimated to be 500,000 tons less than at the corresponding time a year ago.

Central Freight Association lines have adopted the recommendation of the trunk line committee to make a further advance in grain rates on Nov. 1. The rate on export corn from Chicago to New York will be 18 cents per hundred pounds, and on domestic corn 20 cents. On all other articles of grain or grain product the export rate from Chicago to New York will be 20 cents and the domestic rate 22 cents. The new tariff is the highest made in five years.

The Dunham Wrecking Co. has been unable to recover the Scotch-type boiler from the steamer George W. Morley, which sank off Evanston nearly two years ago. A short time ago the company's wreckers recovered most of the machinery. Work has been delayed for the past four or five weeks on account of the severe weather. It is now likely that the boiler, which is the only valuable part of the machinery now in the wreck, will be left at the bottom of the lake until next year.

It is understood that the deal closed by the Carnegie-Oliver interests with the American Ship Building Co. last week was for six boats instead of five. W. L. Brown, president of the American Ship Building Co., announced this week that definite contracts had been closed with the Carnegie people for six large ships. The original announcement mentioned but five. Mr. Brown also stated that negotiations were pending for the building of considerable more tonnage, but were not yet closed.

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The breach between the Lake Seamen's Union and the International Seamen's Union, which led to a withdrawal of the former from the latter body last February, has been healed, and at a recent meeting of the officials of the latter, it was unanimously voted to return. This will reinstate the Lake Seamen to membership in the American Federation of Labor. Though a proposition to advance sailors' wages 25 cents a day to make them equal to the Milwaukee rate of $3 was voted down, it is likely that this advance will be ordered at the next meeting. The local sailors secured an advance in wages less than three weeks ago.

The small passenger steamer Minnie M. changed her nationality this week, and is now a Canadian. It is the first change of registry which has taken place in a decade. For several years the Minnie M. has plied between Makinaw and Sault Ste. Marie in the Arnold line. She is now the property of the Algoma Central Steamship Co. and will run between Sault Ste. Marie and Michipocoten Island. The price paid was $23,000. The Canadians who bought the steamer are interested in the manufacture of wood pulp. Recently a railroad was built from Michipocoten to the "Soo," and the steamer will run in connection with this line.

Among the largest purchases of the Hines Lumber Co., of this city, are the steamer J. D. Marshall and the tow barge Shawnee. The Lake Superior fleet of the company now consists of three tows—the Santa Maria and barges Selden E. Marvin and Wayne, the S. S. Wilhelm and barges Galatea and Nirvana, and the Cormorant and barges Alice B. Norris and Shawnee. The company's Lake Michigan fleet comprises the Louis Pahlow, with barges Delta and Delos L. Filer, the Oscoda with barges Corning and King, and the steamer J. D. Marshall. Vessels under charter to the company are the Colin Campbell, Isabell J. Boyce, S. K. Martin, Stepenson, Grace Whitney, Levi Rawson, Fayette, City of Chicago, and Bertha Barnes.

Officers of the Goodrich line deny that there is any probability that they will add to their fleet for the season of 1900. The only conditions under which additions will be made are that some first-class passenger boat of proper size and already built be offered them at a low price. This, they admit, is not at all likeiy in view of the high prices ruling for raw materials and the further fact that shipyards everywhere are too busy building freighters on old contracts to take any new contracts for passenger vessels for delivery in time for next season's business. The officers admit, however, that it is quite probable that additions to the fleet for 1901 will be made, as the company has averaged an addition of one steamer every eighteen months during the last nine years, and is not troubled for money with which to buy them should traffic demand it. Of the nine boats now owned and operated by the company, six have been added within the period named. The company touches twenty-seven ports and is not troubled for a place to use an extra vessel, should one become available on acceptable terms.

## CLEVELAND.

*Special Correspondence to The Marine Record.*

The tug Cushing, sunk in the river, has been raised and dry-docked.

The Craig Ship Building Co., launched the steamer Porto Rico on Saturday last.

Capt. Marion Finney, has been given charge of the steamer Samuel Mather.

Capt. J. J. Rardon, the well known vesselman of Chicago, visited this port on Wednesday.

The missionary yacht Glad Tidings, Capt. Bundy, stranded on the rocks in Washburn Bay this week and became a total loss.

There has been some disturbances on the docks here this week, between organized and non-union labor, firemen, sailors, and dockhands, had some light rows, but the vessels were in no instance detained.

There now seems no doubt but that Capt. Barry will float the schooner Sophia Minch, ashore near Ashtabula, but it is taking him a good deal of time and expense to do it, however, he has moved her in all about 30 feet.

Fogs have been very prevalent on the upper lakes so far this month, and considerable detention has been experienced by a number of vessels. It speaks highly of the way steamers are handled in the lake trade when so few collisions are reported, notwithstanding the thick foggy weather.

Heavy chartering has been done here this week for next season, at $1.25 on iron ore from the head of the lakes, Marquette $1.15. It is estimated that 15,000,000 tons have been chartered ahead.

Capt. Hiram Henderson, owner of the schooner Typo, began libel proceedings against the steamer W. P. Ketcham, in the Federal Court on Tuesday, for $8,125.30. The Ketcham was attached. The action is taken on account of the loss of the schooner Typo, which the Ketcham sank on Lake Huron October 14th.

The Carnegie Steel Co. has purchased the steel steamer Clarence A. Black. The price is said to be $360,000. Last spring the Black was sold for $240,000, a big advance on her cost of construction. During boom times in freights, during the present summer, she increased in value, beside earning large dividends for her owners.

Capt. James L. Davidson, of West Bay City, has been here looking after the chartering of a number of his vessels for next year. Rumor has it that there are other reasons for his being here at this time which will not now be made known. It is said that he is dickering to dispose of several boats of his large fleet. Among others said to be interested is the Hocking Coal Co.. of which N. Monsarrat is president.

The complete list of the 31 vessels transferred recently by the American Steel Barge Co. to the Bessemer Steamship Co., is as follows: Steamer Colgate Hoyt, J. L. Colby, E. B. Barlett, A. D. Thompson, Thomas Wilson, Samuel Mather, James B. Colgate, John B. Trevor, Frank Rockefeller and Alexander McDougall; barges 101, 105, 107, 109, 110, 111, 115, 116, 117 118, 126, 127, 129, 130, 131, 132, 133, 134, 136, 201 and 202. All of the whaleback model.

The Brown Hoisting and Conveying Machine Co., of this city, are putting up some of the most superb specimens of cantilever cranes ever built. They have completed three cranes for ships being built at Cramps' shipyard. Loads of 9,000 pounds are lifted 95 feet each side of the center line. The battleship crane has a track of 547 feet in all. The cruiser crane is 143 feet 10 inches long, maximum load 25,000 pounds can be lifted 39½ feet from the center line of the trestle. The merchant crane has 15 panels in its trestle, which is 664 ft. long. Its cantilever is 168 feet 10 inches, and the maximum load of 20,000 pounds can be carried 46 feet each side of the center of the trestle, and loads up to 6,000 pounds can be moved 78 feet on each side.

The Welland canal, from now on until the close of the season of navigation will be opened on Sundays. This information was telegraphed to this port by Mr. W. G. Thompson, supervising engineer of the Welland canal. The advices were to the effect that commencing with last Sunday the canal would be open on Sundays hereafter, unless otherwise ordered. This is the usual custom toward the end of the season, when there is such a rush of business that it cannot be carried in the limit of time. It is also reported that the clause in the coasting laws forbidding American vessels to clear with cargo from one Canadian port to another, will be suspended, so that the large quantity of grain at Ft. William may be sent forward, and as there are not enough Canadian bottoms to do this, American vessels are to be let in to the trade.

## BUFFALO.

*Special Correspondence to The Marine Record.*

The usual daily receipts of grain average over a million bushels and it is all handled promptly without any detention to the vessel.

The lumber shovers' strike at Tonawanda is detaining a large quantity of tonnage and there is no present indication of it being promptly settled.

December 1 will terminate the season for the C. & B. line steamers City of Buffalo and City of Erie, unless some unforeseen change occurs in the present plans.

Owing to the scarcity of the railroad cars the Erie canal is doing a heavy business in grain. Coal rates are steady at firmer figures with no indication of much of a change.

The wooden steamer Shenandoah docked in the Buffalo dry dock this week for general overhauling and repairs. The schooner Plymouth and the steamer Byron Whitaker also dry docked.

There is more talk going the rounds about placing a fleet of passenger steamers between this port and Detroit. No notice seems to be taken of the present excellent service, and men are said to be willing to invest about a million dollars in starting this new line. The C. & B. line meets the D. & C. morning boat at Cleveland so that the through route is already in force, to say nothing of the Northern Steamship service carried on by the large twin screw steamers North West and North Land.

For once there is vessel room sufficient to carry all the coal that is offering here. Strange as it may seem, with freights going up as they did, there was a shortage of tonnage that continued right through the summer. What really forced the shippers to use the lake route at such high rates was the shortage of cars. This still continues to such an extent that there is no chance of improvement. Erie has shipped to date about 50,000 tons more coal this season than last, but the Welland canal route has fallen off more than 30,000 tons. There is a notable dropping off of coal shipments to minor ports. More than half the 95,000 tons reported for the week went to Chicago, nearly all the rest being divided about evenly between Milwaukee and Duluth.

## DETROIT.

*Special Correspondence to The Marine Record.*

It is stated here that J. H. Graham, of the Graham & Morton line, made an offer to buy outright or charter the new steamer Pennsylvania, now running between Erie and Buffalo.

The plant of the old Frontier Iron Works is being reopened by the Northern Engineering Works. The plant has been extensively improved and the manufacture of the Frontier gas and gasoline engine will doubtless be resumed.

The Sault Ste. Marie water power is figured on giving 40,000 horse-power, and will be determined from a flow of 70,000 cubic feet of water per second from a fall of 19 feet. The available head is 16 feet, and the volume of water required 31,250 feet per second.

The big freighter now in the stocks in Wyandotte and being built for the McMillans will probably be launched early in November and be completed for early navigation next spring. Her dimensions are the same as the Angeline, recently completed for Cleveland owners.

Acting Secretary Spaulding has directed the collector of customs to refund the duty paid on the cost of the repairs to the schooner Theodore Voges, which struck an obstruction in the Detroit river and was repaired at Amherstberg, Ont. It was shown that repairs were necessary to allow the boat to proceed to her destination.

Mrs. Rose Campbell, of No. 183 Lovett avenue, Detroit, mother of the sailor, John Campbell, drowned in the wreck of the schooner Typo on Lake Huron, requests that any one finding the bodies of any of the victims of the wreck communicate with her. Her son's body may be identified by the absence of the middle finger of the left hand at the first joint.

Several more handy passenger steamers like the Pennsylvania or Kirby ought to be built on speculation by the Detroit Ship Building Co., at their earliest opportunity. These little steamers could have been sold several times over if their purchase price had been within 10 or 20 per cent. of their cost, and this, too, after allowing for builders' profits, etc.

There is a little squabble on here this week between the late master of the mail boat and the postmaster. It appears that charges have been filed but they only amount to the grumblings of a discarded servant egged on perhaps by other parties in interest. The Detroit river marine service is well conducted and of too valuable a nature to be triflingly pestered by individuals.

It is learned here that the elevators of the Northern Grain Co., at Milwaukee, and the elevator at Manitowoc are in bad shape as the result of their inability to secure boats enough to keep the grain moving. The report that Chicago elevators are anticipating something of the same sort is given some color by the offer of 3½ cents made for 1,000,000 bushels of corn room to Buffalo for November loading. The agent who was offered this figure was unable to find enough boats at that price to move the grain.

An examination of the engines of the yacht Enquirer, which is in the upper dock of the Detroit Ship Building Co., shows the ravages of salt water on machinery not specially built for service on the coast. It is estimated by Engineer Crisp that it will take a full month to complete the overhauling of the craft, removing injured parts and replacing with new, etc. The tail shaft between her wheel and hull had the appearance of having been eaten away with an acid and the entire length of the shaft to the engine was slightly pitted by the action of salt water.

D. H. Bryant, of Detroit, pilot of the United States revenue cutter Fessenden, died on Thursday last at the home of his daughter in Chicago. He was born in Ovid, N. Y., May 14, 1827, and became a sailor on the Great Lakes at the age of 12. It is a profession he had followed for 60 years. In the days of the old wooden vessel he was one of the best known captains on the lakes, and even yet everyone familiar with lake matters knows Capt. Bryant. His home had been in Detroit ever since he entered into the United States service 14 years ago. The deceased was a member of a Cleveland lodge of Odd Fellows, and he belonged to lodge No. 7 of the Shipmasters' Association.

The steamer W. P. Ketcham ran down the little schooner Typo in Lake Huron last Saturday morning. The Typo foundered and four of the crew were drowed. The names were Henry Ledford, mate of the Typo; Dan Carr, seaman; John Campbell, seaman; Mrs. Adams, cook. The Captain of the vessel and two seamen managed to escape, and were picked up by the Ketcham. The Ketcham was bound from Chicago to Buffalo with a cargo of grain. The Typo was met off Middle Island, near Alpena. After picking up the survivors the Ketcham continued on her voyage. The Typo was owned by J. P. Nagle, of Toledo. She measured 335 gross tons, and was built in 1873. The Ketcham belongs to the Chicago Transit Company, and is commanded by Captain Carter.

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A FIGHT against the Chicago drainage canal is being organized in St. Louis. The district to be drained covers 180 square miles, including most of Chicago. The drainage canal is practically an immense open ditch, 29 miles long, dug, dredged and quarried through solid rock, swamps, drift and sand. No public work in the world approaches it in magnitude.

## DULUTH—SUPERIOR.

*Special Correspondence to The Marine Record.*

Work on raising the sunken tug Record is progressing and it is expected that she will be alongside her dock again by the end of the week.

The entire season's output of the Keystone Lumber Co., at Ashland, Wis., has been sold to a Chicago dealer. All but 8,000,000 of the 50,000,000 feet of lumber covered by the transaction, will be taken to Chicago by lake. The 8,000,000 feet is now on the docks awaiting shipment by rail, as tonnage can't be secured.

The tug Carrington lost two scows loaded with lumber camp supplies on the south shore of Lake Superior on Sunday morning. A gale prevailed all night from the northeast and in the heavy sea the tow line parted. Nothing could be done to save them and they went ashore. The cargoes of the scows are valued at $4,000, all of which however will not be lost.

The Merrill-Ring Lumber Co. has just purchased of Gratwick, Smith & Freyer 13,000 acres of pine timber land in Lake county, Minn. The consideration is withheld, but will approximate half a million dollars. The purchase joins 7,000 acres the Merrill-Ring Co. recently purchased from Burrows & Rust, of Saginaw, and the total purchase gives the buyer 200,000,000 feet of timber with which to stock its large mill at Duluth.

All of the flouring mills at the head of the lakes, except the Imperial at Duluth, are shut down. The Superior mills are selling no flour, as they cannot get boats for shipment, and they are all stocked up to the limit. A little more flour could be made if a lot of shifting of that already stored were done, but it is thought that this would not be a paying proposition. The shipments of flour have been rather light for some time past, and there is some talk that all-rail shipments will be very frequent the coming winter.

The Duluth board of local steamboat inspectors has summoned the masters of the tugs Industry, Buffalo and Mystic to appear Oct. 16, and tell what they know as to the blame for the sinking of the steamer Peerless, by the barge Stewart. The outcome of the investigation will serve to determine who will have to stand the damage. The Lake Michigan and Lake Superior Transportation Co., of Chicago, has libeled all three tugs, and the application for an investigation was made on behalf of D. E. Stevens, of the Stevens Towing Co.

Norman B. Conger, marine agent on the Great Lakes for the Weather Bureau, Department of Agriculture, is at present engaged in a tour of inspection of the wind signal stations on Lake Superior between Duluth and Kewaunee Point. As a result of his visit to Duluth, Mr. Conger will recommend that the night signals at Duluth be increased in power. Mr. Conger has also decided to recommend that at all of the wind signal stations on Lake Superior between Duluth and Keweenaw electricity be used for displaying wind signals at night. He says that the power is available at the several points except at the Portage ship canal and Eagle harbor.

Foley Bros., of St. Paul, Minn., have been awarded the contract for the erection of the largest iron ore dock in the world, to be built by J. J. Hill, at Allouez Bay, work will begin very soon, and the structure will be completed before the opening of navigation in the spring. The cost will be in the neighborhood of $200,000. The dock will be several feet higher than any other dock at the head of Lake Superior, so that the largest class of vessels will be able to load, even when the water is at a very high stage. The pockets are to have a capacity of 250 tons each, and the total capacity of the dock will be 62,000 tons. The neccessary dredging has already been done.

The average dates of the opening and closing of navigation at this point since 1871 are as follows: The average opening is May 1, and the average closing is December 5. The earliest, in 1878, was on April 12. The latest opening was May 24, 1873. The earliest close of general navigation was November 14, 1878, and the latest close was December 27, 1881. The shortest season of general navigation was 185 days in 1873 and the longest season of general navigation here was last season, 243 days. The figures are based on the first arrival of a boat from the lower lakes in the spring and the last arrival or the last departure from or to the lower lakes in the fall. The figures are calculated to show the length of the season of general navigation for each year, together with the average length for the period since 1871.

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DOWN to Charles II's time it was customary to name and baptize a ship after she was launched—sometimes a week or two after. The old Tudor method used for men-of-war was still in use. Pepys' diary shows that. The ship was safely got afloat, after which some high personage went on board with a special silver "standing cup" or "flaggon" of wine, out of which he drank, naming the ship, and poured a libation on the quarter-deck. The cup was generally given to the dock-yard master-shipwright as a memento. When did the present system of naming and baptizing a ship before she is sent afloat come in? I trace the last explicit mention of the old method to 1664, when the Royal Katherine was launched (see Pepys). The first mention of smashing a bottle of wine on the bows of a British man-of-war that I have found is in a contemporary newspaper cutting of May, 1780, describing the christening of H. M. S. Magnanime at Deptford, but nothing is hinted that it was then a new custom.—English Notes and Queries.

## FLOTSAM, JETSAM AND LAGAN.

The appointment of a joint American and Canadian commission to examine into a question of maintaining the levels of the lake in the interest of navigation, is proposed.—The Grain Dealers Journal, Chicago.

Another shipyard is projected to be built and operated by the Seaboard Iron & Steel Co., capital, $1,500,000; probable site, Whitestone, L. I. The iron and steel plant there will be greatly enlarged. They want material.

The Spanish Government has sold the Havana floating dock for $600,000 to a syndicate of Vera Cruz merchants. Several New York firms have been asked for terms for conveying the dock to Vera Cruz. The purchasers wish to take it away about the beginning of next month.

It is likely that the Royal Canadian Yacht Club will send a challenge to Chicago for the Canada's cup immediately after the annual meeting this fall. Comodore Jarvis is in New York and may commission W. Fife, who is also there with the Shamrock, to build the boat. It is already announced that Mr. Jarvis will sail the new Fife challenger.

The Hydrographic Office of the Navy Department has published a new chart of the world showing the ocean tracks with distances given in nautical miles. The longest steamer route given on the map is that connecting New York and Esquimault by way of Cape Horn, 16,290 miles. This is exceeded by the track used by sailing vessels connecting New York and Yokohama via the Cape of Good Hope. This is 16,900 miles in length.

Farragut's old flagship, the Hartford, on which Admiral Dewey served with the first admiral, has been placed in commission at the Mare Island navy yard, California. She will be used as a training ship for landsmen under Commander Joseph S. Hawley, U.S.N. The Hartford will make a voyage from San Francisco to New York by way of the Straits of Magellan. She has been thoroughly overhauled and been made practically into a new ship at a cost of $600,000.

A kick is now going the rounds regarding the Port Huron life-saving station, located eight miles up the shore with absolutely no modern means of communication between the city and station. There is no telephone or telegraphic communication provided, the only way to get word there or back being by messenger on horse or vehicle and over a road, a great portion of which is deep sand. The chief of the life-saving service had the situation pointed out to him, when he built the station last year, but for some reason would not alter the location.

A dispatch from Fairport says: "The whaleback barge 127 struck on a new shoal in Lake Erie, on Monday morning, and as a result was brought into port leaking. The barge was proceeding on the course from Cleveland to Fairport, and when she brought up was two and a half miles from shore and four miles west of the piers at this place. The barge passed over the obstruction and immediately afterward pieces of wreckage came to the surface. The lead line indicated 40 feet of water, and it is believed the wreck of the dredge lost off this port several days ago was the object she found.

The proposition to build elevators at Montreal, which has been kept before the Canadian Government by W. J. Conners and Harvey D. Goulder, is as follows: If the Government and Harbor Commissioners will grant them 99 year lease of part of the Windmill Point pier for the site of an elevator and for usual berths and part of the pier south of it for store room, and will guarantee a depth of water equivalent to the depth in the harbor and in the river between Montreal and Quebec, they will invest one million dollars and over in elevators, permanent sheds and barges. They profess their willingness to agree to any conditions that may be though desirable to ensure equality of use of their facilities by all parties, and prevent danger from monopoly.

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## LETTERS AT DETROIT MARINE POST OFFICE.

OCTOBER 18th, 1899.

To get any of these letters, addressees or their authorized agents will apply at the general delivery window or write to the postmaster at Detroit, calling for "advertised" matter, giving the date of this list and paying one cent.

Advertised matter is previously held one week awaiting delivery. It is held two weeks before it goes to the Dead Letter Office at Washington, D. C.

| | |
|---|---|
| Booker, Sam, Minch | Jordan, W. M., 2, Andaste |
| Baldwin, J. J., H. Houghton | Jackson, G. R., Wright |
| Brake, Mary, 2, Tempest | Larsen, Andrew, 2, Michigan |
| Brown, Henry, Saviland | Lambert, Leonard, Law |
| Bartlett, Owen, Pabst | Landers, Jno., Panther. |
| Cartright, Geo., I.H.Ketchum | Mulcahy, Bert |
| Cluckey, John | Miller, Ira D., Choctaw |
| Duby, Thos., Savidge | McCarthy, G. H., America |
| Deremo, Clark, Ketchum | McMann, F., M. Hopkins |
| Durrant, S. O., Sauber | Rano, Wm., Ketchum |
| Gordon, Chas. | Rowe, Robt., Rhodes |
| Grogan, Wm., Mariposa | Russell, Omer, Brake |
| Grimsby, Frank, Bradley | Sulley, J. |
| Hamringa, K. L., Mona | Stapleton, M., Rhodes |
| Hughes, John, C., Ketchum | Taylor, Geo., Siemens |
| Hall, S. L., Donaldson | Tisdale, Herb., 2, Rhodes |
| Hart, Tony, Donaldson | Woods, Chas., Bradley |

## THE GREAT IMPORTANCE OF LEGISLATION TO ENABLE AMERICANS TO DO A FAIR SHARE OF THEIR OCEAN CARRYING TRADE.

If a foreign foe should invade our land how long would it be before the tread of armed hosts would be heard in every State of the Union; how long before the people as a unit would rise in their might and demand that our national Congress pass without delay an act providing for all the men and money necessary to drive the invader back? Is there an American but will not answer "Not a day?" Make it more personal! Suppose a robber breaks in your house to carry off or destroy property that you have labored long years to accumulate; would you hesitate to protect your property and defend your rights? Not a second. Suppose, again, that you had enjoyed a trade, and other merchants plant themselves alongside of you, and with bigger stores and larger stock of goods attract the trade from you. What would you do? Would you move into a smaller shop; reduce your stock; cut off advertising; discharge your clerks? Not much, unless you wanted to die of dry rot.

You ask what has all this to do with the revival of our foreign shipping interests. Can you not see the parallel? Your country has been invaded, your houses have been robbed, your trade has been taken away from you. Formerly the ships of England had only 10 per cent. of the foreign trade and American ships enjoyed 90 per cent. Now England, France, Germany, and other foreign powers enjoy—yes, "enjoy" is the word—90 per cent., while we hold barely 10 per cent., and every year makes it worse. It was bad enough when the enemy had ships of only 2,500, 3,000, or, 5,000 tons; but suspecting that we would come to our senses some time in the future they determined to make it as hard for us as possible, and they built the enormous Lucania. Campania, and later the gigantic Oceanic, and say more to follow. It is a good deal like the wholesaler saying: "Why trade at little retail shops when you can buy at our splendid and palatial establishment." Well, say you, what can we do about it? Do! why do just what the United States did in 1776, repeated in 1812, and did over again in 1898. Rise in our gigantic strength and take back what has wrongfully been taken from us; say to the world: "This has been going on for thirty-eight years and has got to stop."

Here we are going to Europe every year by the thousand, and sending our wheat, corn, oats, cotton, and manufactured goods to the other side by the hundreds of thousands of tons per annum and all the earnings going to foreigners—$200,000,000 or more a year paid by Americans—what for? Why, to help them build more ships to carry you and your goods; to establish foreign savings banks; to feed and clothe the people of Europe; to open shops in London, Liverpool, Berlin, Hamburg and Havre. Is it not about time we built some ships, thought about our own savings banks, fed and clothed our own people, and remembered that we had a New York, San Francisco, New Orleans, Chicago, and other cities that had room for more stores? I hear some one say, "Yes, this is all true, but every one who discusses this subject deals in generalities; tell us just what to do in particular." Why, do just what England and other foreign nations have done to get the trade away from us—put up the cash. "Well, but"—there is always a "but" with a pessimist—"England has the advantage of us in lower wages, lower cost of maintenance," etc., etc. Has she? Well, notwithstanding this she finds it necessary to pay out about $4,000,000 per year in subsidies and has found it a splendid investment, and other nations have found out the same thing. The argument that you use is all right, but you use it on the wrong side. Because England has these advantages is the very reason why we should do the same thing and more of it. If England can afford to do all this with her population and her little sea-coast, what can we not afford to do with our 75,000,000 of people, a sea-coast bordering on two oceans, and grain and cotton fields and mauufactories enough between them to supply the world? Realize once and always that the money so expended is not lost or sunk; it is the best paying investment that the United States can make. It will speedily come back into the homes and pockets of every American man, woman, and child in the North, in the South, in the East, and in the West—come back to the merchant and manufacturer and to our vast laboring population; come back to men of all political parties.

I deal not in this article in dry statistics, but appeal to the common sense of the American people, and ask that they rise *en masse* in their sovereign power and demand of Congress the enactment of a law that will establish our flag on the high seas as firmly and as securely as it is established all over this vast domain that is our common heritage.

D. D. C. MINK,
President American Steamship Association.

## LAKE TRAFFIC TREMENDOUS.

Navigation statistics of Lake Superior to October 1 show a tremendous traffic. These are the chief items of tonnage:

| | September. | 1899. |
|---|---|---|
| Iron ore, gross tons | 1,818,000 | 9,906,518 |
| Lumber, feet | 146,642,000 | 735,389,000 |
| Wheat, bushels | 8,385,905 | 33,211,800 |
| Coarse grain, bushels | 2,192,133 | 17,422,000 |
| Flour, barrels | 1,047,035 | 4,751,000 |
| Coal, tons | 448,950 | 2,767,600 |

For the year to September 30, which includes just five months, there was a total freight tonnage for Lake Superior of 17,684,150 tons, more than for any full season up to 1897. In all for the five months 14,544 ships, or almost 100 a day, passed into Lake Superior.

The Inland Ocean, West Superior, announces that the great bulk of this freight, both east and west bound, originated at the head of the lakes, and its average lake haul has been about 850 miles.

There are vast quantities of freight, largely merchandise, bound both ways, that can by no possibility be moved by water this year. All the package freight lines are in a state of congestion, with more business than they can handle during the remainder of the season. Millions of feet of lumber have already been sold to eastern wholesalers that cannot be moved till next spring and arrangements are now closing for the all-rail shipment east during the winter of a great quantity of iron ore and the return of like tonnage in coal.

To October 1 the total iron ore shipments from the lake ranges amounted to almost exactly 13,000,000 tons, within 1,500,000 tons of the entire movement of the preceding season, which was by 15 per cent. the largest on record. Enough more ore will be shipped this fall to make a total of not less than 16,000,000 for the year, and perhaps more. In addition to this probably 1,000,000 tons more will be shipped to furnaces all-rail during the winter. The furnaces of the north and east that run on Lake Superior ores are now consuming at the rate of about 17,000,000 tons a year.

In the past year the stock of nearly all the Lake Superior mining companies has advanced heavily, except in the case of those formed as subsidiary organizations of steel making companies, and which mine ore at cost and therefore cannot pay dividends. The Lake Superior consolidated mines, whose issued capital is $28,600,000 has advanced in market value more than $10,000,000 since August 1, 1898. The stock of this company is almost all in the hands of John D. Rockefeller.

About 8,000 men are employed in the mines of Minnesota alone, and those who will be thrown out of work by the shut-down of open pit mines in the next few weeks will be all taken care of in the underground mines and at lumber camps for the winter.

## ELECTRICITY FOR TOWING CANAL BOATS.

The project of towing the canal boats on the Erie canal, in the state of New York, by electric power generated by the Niagara Falls plant, has been in agitation for several years. It is now stated that the plans for two systems of performing this work have been laid before Mr. Partridge, superintendent of public works, and that an order for $1,000,000 worth of apparatus has been placed with a Philadelphia firm, conditional upon his approval. One of these systems is based upon the use of storage batteries carried by the tow boat, which batteries are to be charged at convenient points along the route. The other, and most promising system, involves the use of an automobile traveling upon the tow path, which shall keep in contact with a trolley line; at the same time transmitting an electric current by means of a flexible wire connection to the boat from the feeding trolley line, by means of which suitable motors in the boat are enabled to operate the propellers.

## VESSELS CLASSED.

Vessels classed and rated by the American Bureau of Shipping, New York, in the "Record of American and Foreign Shipping:" Barge, J. B. King & Co. No. 20, owned by the J. B. King Transportation Co.; schooner, Mary T. Quinby; tern, William E. Downes; tern, Gardiner B. Reynolds.

## CONSTRUCTOR HICHBORNS' REPORT.

In his annual report to the Secretary of the Navy Chief Constructor Hichborn lays special stress upon the importance of continuing the work of improving the plants at the various navy yards, inviting attention to those at Boston and League Island. A plant is also recommended at Algiers, La., as without it the new dock will be worthless when completed.

Under the head of dry docks the report points out that the present building programme does not affect the two most important navy yards, viz., New York and Norfolk, at which a new dock of the largest size is urgently needed in veiw of the rapid increase of the number of battleships in commission. Marine railways also are said to be necessary for the economical handling of torpedo boats and two such are recommended at New York and one each at Portsmouth, League Island, Norfolk, Port Royal and Mare Island.

Under the head of new construction the report sets out the fact that contracts for the more important ships authorized by the last Congress, could not be let because of the limitations placed upon the cost of the armor. Nevertheless complete specifications for these vessels have been prepared and are included in the report. Work on the design for gunboat 16, to replace the Michigan, has been suspended, pending definition of the characteristics that will be permitted under the treaty with Great Britain. Fourteen vessels were added to the navy during the last fiscal year; four Spanish vessels sunk during the war were raised and added, and 17 small gunboats were purchased or placed on the Asiatic station. On the other hand 41 vessels were dropped from the naval list, including the American line chartered ships, number of auxilary vessels sold, the revenue cutters and light-house vessels turned back into their old service, and a couple of monitors. On July 1 there were building for the navy 48 new vessels.

In view of the delay encountered in securing armor for the new ships at satisfactory prices, the chief constructor feels that the time is opportune to renew his recommendation that the department contract with the shipbuilder for the ship complete with armor, instead of making separate contracts for the latter.

Among the lessons of the war referred to in the report is the importance of sheathing ships, as well as restricting the use of combustible material upon them, and of fireproofing such material as must be used. The severe test applied by the war to our ships under trying conditions of climate, resulted satisfactorily and little modification of new designs has been found necessary. The extended use of electricity as an auxiliary is recommended, and the bureau is making great progress in this direction. The present strength of the corps of naval constructors is said to be insufficient, and a considerable increase is suggested.

## MARINE HOSPITAL SERVICE.

PROVISION MADE BY CONGRESS FOR SHELTER FOR DECK CREWS ON WESTERN RIVERS.

The hardships suffered by the deck crews of western steamboats by reason of want of proper shelter in cold weather formed the subject of a number of reports from the medical officers of this service stationed on the Ohio and Mississippi rivers, as may be seen in my last annual report (p. 22), and the recommendations which I made to ameliorate this unfortunate condition were favorably considered by the Committee on Commerce in both Houses of Congress, and in the act approved March 3, 1897, the following provision covering this matter is found:

On and after June 30th, 1898, every steamboat of the United States plying upon the Mississippi river or its tributaries shall furnish an appropriate place for the crew, which shall conform to the requirements of this section, so far as they shall be applicable thereto, by providing sleeping room in the engine room of the steamboats properly protected from the cold, winds, and rain by means of suitable awnings or screens on either side of the guards or sides and forward, reaching from the boiler deck to the lower or main deck, under the direction and approval of the Supervising Inspector-General of Steam Vessels, and shall be properly heated.

It is confidently believed that this law will prevent much suffering from disease and frostbite, with which the deck crews on our western steamboats have been afflicted each winter because of unnecessary exposure due to heartless neglect of owners and masters.—Supervising Surgeon-General of the Marine Hospital Service of the United States.

## FAST STEAMING.*

The combined steam turbine engine has been so fully described in the Proceedings of the Institution of Civil Engineers, and the Institute of Naval Architects, both as to its application to the propulsion of ships, that it is only necessary on the present occasion to refer to its leading features when designed for the propulsion of fast passenger vessels. In the abstract it may be described as an ideal rotary engine without reciprocating parts, with a uniform turning moment and almost complete absence of vibration, and of extremely small weight. When undertaking to read this paper some months ago before the British Association, it was hoped that the trials of one at least of the torpedo-boat destroyers fitted with turbine machinery of exceptional power would have been completed; this, however, has not been possible, the time occupied in construction having considerably exceeded anticipation, and it is only within the last few weeks that the preliminary trials usual with this class of vessel, have been commenced. So far as these trials have yet proceeded they show a very satisfactory performance, and an excellent result as to steam consumption, also a complete absence of vibration at all speeds. Unfortunately, after the short preliminary trials referred to, the vessel was run into while lying at her berth during a dense fog, and so seriously damaged that she has been in dock for the last month, the bow having to be entirely rebuilt.

She is now, however, ready for further trials, when the machinery will be put to the full designed power, and it is anticipated that the guaranteed speed of 35 knots will be reached under the normal conditions of forcing usual in such vessels.

The exhaustive series of trials made by Professor Ewing, F. R. S., on the Turbinia, showed a consumption of about 14½ lb. of steam per indicated horse-power at a speed of 32 knots, and a somewhat less consumption at the maximum speed of 34½ knots, a more favorable result than is obtained with ordinary engines of the torpedo-boat or destroyer class in this country.

The measurements so far recorded on the first preliminary trials of the destroyer seem to justify the expectation of a greater degree of economy in the turbine engines of destroyers than those obtained in the smaller engines of the Turbinia. Generally speaking, it may be said that the larger the size of the propelling machinery of the steam turbine class, the more favorable are the conditions for securing the highest degree of economy in steam with a minimum of weight, and the greater the simplicity of the machinery.

For fast passenger vessels, and especially for cross Channel service, the turbine system of propulsion offers great and important advantages over the ordinary screw or paddle engines. In the first place the steam consumption of the turbine engines is no more—perhaps somewhat less—than the best ordinary triple compound engines.

Then the weight of engines, shafting, and propellers is under one-half that of ordinary screw engines, shafting, and propellers, and under one-third that of ordinary paddle engines of the same power, so that there is much less weight to be propelled; besides this, the hull itself may be of lighter structure than is admissible with ordinary engines, owing to the absence of racking stresses from the machinery.

With turbine engines no lubricant whatever enters the steam part, so that the boilers become much less charged with oil than is the case with ordinary engines, and express water-tube boilers of the small-tube type may be maintained in satisfactory working conditions for long periods; and, further, it is understood that the Board of Trade will be prepared to so modify their system of periodic inspection as to permit of such boilers being used for regular cross-Channel service.

But, perhaps the most important considerations are the increased comfort to passengers owing to the absence of vibration, and a remarkable smoothness of motion analogous to that of a sailing vessel; also, the greater depth at which the propellers are placed below the surface of the water reducing the liability to racing of the engines, which enables the speed of the ship to be maintained in heavy weather in a way that is totally impossible in the case of ordinary screw or paddle vessels.

The endurance of turbine machinery appears to be beyond question; on many occasions engines have been run continuously for three weeks, and after some years of work there is found to be practically no erosion by the steam on the blades.

*A paper read before the Section G, of the British Association, at the Dover Meeting, by Hon. C. A. Parsons, M. Inst. C. E.

The model on the table is of a proposed cross-Channel boat of 30 knots sea speed in moderate weather. It will be observed that it is proposed to place all passengers under cover, and for this purpose the upper deck has been carried almost the whole length of the vessel; large plate glass windows at short intervals extend from the former portion of the vessel to the stern. The free board is greater than is usual in vessels of similar size, and the windows are placed high up above the spray, and the three decks extend nearly the whole length of the vessel, affording ample promenade space. The passengers' luggage is contained in two large tanks, in crates, to be hoisted in and out by jetty cranes at the termini, adapted for placing them on railway trucks suitably fitted for their reception. If a service of 30 knot vessels were placed on the Newhaven and Dieppe line, it would become the fastest route from London to Paris; also, if the system were properly carried out as suggested, the time on the Dover and Calais route between London and Paris would be shortened by about half-an-hour, and the duration of the sea passage much reduced

It will be observed that the draught of water with turbine engines does not necessarily exceed that of paddle-wheel vessels, and as turbine engines are more readily and quickly manipulated than ordinary engines, and each side of the propelling machinery can be put ahead or astern independently, the manœuvering power is practically equal to that of paddle-wheel vessels.

The particulars of the proposed 30 knot turbine boats are as follows:

| | |
|---|---|
| Length | 275 ft |
| Beam | 80 ft |
| Depth molded | 21 ft |
| Draught | 9 ft. 3 in. about |
| Displacement | 1,000 tons about |
| Speed | 30 knots |
| Indicated horse-power | 18,000 |

It is estimated from the results so far attained with the Turbinia and torpedo-boat destroyers, that the coal consumption at the full speed of 30 knots, will not exceed 2 lbs. per indicated horse-power, a result superior to that obtainable with triple-expansion engines and express boilers under similar conditions.

Designs have also been prepared for other vessels of larger dimensions, such as an express Channel steamer of 18,000 displacement, 50,000 indicated horse-power, and a speed of 40 knots.

A model of a proposed Atlantic liner is on the table; her dimensions are:

| | |
|---|---|
| Length | 600 ft |
| Breadth | 63 ft |
| Depth | 42 ft |
| Displacement | 18,000 tons |
| Indicated horse-power | 38,000 |
| Speed | 26 knots |

In conclusion, it would seem that very great and unquestionable advantages to be derived from the adoption of the steam turbine system of propulsion for all fast passenger and cross-Channel vessels will soon lead to the commencement of its general application, both in this and other countries, to this service.

## VISIBLE SUPPLY OF GRAIN

As compiled for THE MARINE RECORD, by George F. Stone, Secretary Chicago Board of Trade.

| CITIES WHERE STORED. | WHEAT. Bushels. | CORN. Bushels. | OATS. Bushels. | RYE. Bushels. | BARLEY Bushels. |
|---|---|---|---|---|---|
| Buffalo | 1,734,000 | 706,000 | 293,000 | ..... | 195,000 |
| Chicago | 9,726,000 | 5,584,000 | 1,372,000 | 391,000 | 7,000 |
| Detroit | 794,000 | 10,000 | 8,000 | 12,000 | 1,000 |
| Duluth | 7,102,000 | 220,000 | 83,000 | 207,000 | 568,000 |
| Fort William, Ont. | 1,500,000 | ..... | ..... | ..... | ..... |
| Milwaukee | 33,000 | 6,000 | 2,000 | 6,000 | 23,000 |
| Port Arthur, Ont. | 100,000 | ..... | ..... | ..... | ..... |
| Toledo | 2,158,000 | 861,000 | 673,000 | 8,000 | 1,000 |
| Toronto | 109,000 | .... | 3,000 | ..... | 12,000 |
| On Canal | 282,000 | 1,041,000 | 285,000 | 9,000 | 503,000 |
| On Lakes | 1,825,000 | 1,994,000 | 442,000 | 34,000 | 496,000 |
| Grand Total | 47,314,000 | 15,065,000 | 7,069,000 | 819,000 | 2,102,000 |
| Corresponding Date, 1898 | 14,598,000 | 24,563,000 | 6,080,000 | 1,308,000 | 2,750,000 |
| Increase | 2,979,000 | 315,000 | 439,000 | 13,000 | 371,000 |
| Decrease | ..... | ..... | ..... | ..... | ..... |

While the stock of grain at lake ports only is here given, the total shows the figures for the entire country except the Pacific Slope.

## WRITE, WILLIAM.

Mrs. Wm. Ryan, 24 Lovatt Place, Toronto, Ont., would like to hear from her son who is supposed to be sailing out of Cleveland. He has been away two years and if still "on deck" his mother would be glad to hear from, or about him.

## LITERARY NOTICES.

The Bullock Electric Manufacturing Company, Cincinati, Ohio, has issued bulletin No. 1435, which gives excellent suggestions as to the availability of using electric motors for various purposes in driving single machines. The direct applications to lathes, boring mills and other machine tools are excellent.

One of the most disastrous and picturesque storms that ever visited the New England coast was "The Great November Storm of 1898." The full story of its far-reaching effects and many incidents of stirring human interest has been written for the November Scribner's by Sylvester Baxter. The pictures by H. W. Ditzler, who was there at the time, are vivid realizations of some of the scenes along the shore.

The interesting history of the "Beginnings of the St. Lawrence Route," by Arthur Weir, B. Ap.Sc., Montreal, which recently appeared in the Canadian Engineer, has been reprinted in pamphlet form. Mr. Weir has gathered a great amount of hitherto unpublished matter in this essay and has presented it in such an attractive form that many will be glad to have it in this convenient form for future reference. Although the edition is a very limited one the price is only ten cents per copy.

The October number of St. Nicholas marks the end of the magazine's six and twentieth year, and brings to a close several serials that have been running for six months or more. "Trinity Bells," by Amelia E. Barr, is one of these; others are Carolyn Wells' "Story of Betty," and Rupert Hughes' "Dozen from Lakerim." These are works of fiction; but besides these there are in this number several short stories, in which facts and fiction are mysteriously mingled, and others that are founded upon fact and built up of the same material.

The Quebec and Lake St. John Railway have published some books descriptive of the scenery on the line of their well known road, which also contain many good illustrations of the sportsman's variety. The names of the books are as follows: "Guide to the Lake St John and its Tributary Waters," "Ye Ancient Quebec," and "A Tale of Lake St. John." Any or all of these will be sent to any person interested. Their time tables are original in design, and much more complete in information and description than the ordinary run of railway folders.

The international races for the America cup are the chief features of the October number of Outing, which bears on its cover a marine design comprising pictures of the Columbia and the cup for which there is so much rivalry. The leading contribution is by Capt. A. J. Kenealy, who gives his opinion in regard to the representative yachts under the caption "Columbia, the Pride of the Ocean." The article is illustrated with a number of spirited pictures of the yachts. The issue contains the usual amount of matter of interest to hunters, and is a thoroughly good one.

F. Tennyson Neely, 114 Fifth ave., New York, has published "The Cruise of the Scythian in the West Indies," by Miss Susan de Forest Day. This is the first of a list of most interesting books to be issued in "Neely's Log Book Series," which will embrace the voyages, expieriences and histories of a number of famous yachts. They will be descriptive of the cruises these yachts have made and the countries visited by them. Miss Day has written in the attractive manner the story of the cruise of her yacht in the West Indies. It abounds in charming description of St. Thomas, St. Kitts and many places of note. The books will be sent on approval to any address, and may be returned at the publisher's expense, if desired. It is a beautiful volume, representing the highest art of book making. There are 38 full-page illustrations.

The enterprising press clipper, who had the foresight to preserve complete files of all the papers published through the Spanish American War., is now reaping his harvest. The most noble piece of work so far turned out was the Dewey Album, which has attracted-world wide attention. This book was paid for by subscriptions from the large ship owners of the port of New York, and acting on this hint some of the warm friends of Admiral Winfield Scott Schley called upon Burralle's Press Clipper Bureau and after assuring themselves that an elaborate, exhaustive history of the Admiral's work at Santiago could be compiled, they commissioned the Burrelle to make such a book and all friends of the Admiral will be invited to contribute to the work. As was the case in the Dewey album the title page contained the signatures of each contributor. Such a compilation will have more than ordinery historical value.

MARINE RECORD

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CLEVELAND, O., OCTOBER 19, 1899.

THE Rockefeller interests succeeded in purchasing a large fleet of lake vessels, the Carnegie interests have proceeded to build, and so goes on the war of the industrial and financial giants.

THE steamer Huascar towed two large cargo lighters from Liverpool to Para, one astern of the other. Nothwithstanding the great drag these craft were to the vessel, she arrived ssfely with her tow, and without having any stoppage en route, in 27 days, an unprecedented feat. The distance covered was 4,195 nautical miles.

ALTHOUGH the Soulanges canal has been formally opened, it does not follow that any large amount of traffic will go through this season. Any vessel drawing over 14 feet could not be accommodated. Some of the gates work with difficulty, and the sluices are not yet in good order. Practically, the canal will not be in working condition until next spring.

A NEW self-recording anemoscope has been devised in England which records the direction of the wind on an open scale, has been in use at Southport for more than a year, and works very satisfactorily. The vane, which is an exceedingly light, large, but double-bladed one, is sensitive even in light airs, and is steady in the strongest gales. The records from this anemoscope were very clear and of an interesting character, and showed the instrument to be a valuable companion to the Dines pressure-tube anemometer.

AT the deep waterway convention held in Peoria, Ill., last week, it was resolved to petition Congress this winter to consider the deep waterway or ship canal project. The deep waterway convention passed strong resolutions favoring the ship canal enterprise, and a committee of prominent workers in the state was named to take the matter in charge. In a few weeks they expect to outline the plan of campaign. They hope to have the liberal support of many leading men in Congress. Senator Cullom, in his speech before the convention, pledged his hearty support to the work.

ONE of the first acts of Congress under Washington's first administration was to protect our merchant marine by levying discriminating duties on goods imported into the United States. If they were imported in American ships the duty was ten per cent. less than if they were imported in the ships of any other nation. Under the operation of that wise law our merchant marine increased till it rivaled that of England and far surpassed that of any other country. We can not impose discriminating duties again on account of treaty stipulations, but there are other ways of building up our merchant marine and the country should immediately avail itself of these openings.

AT the international commercial congress held on Monday last at Philadelphia, J. P. Allen of the Toronto Board of Trade, said that Canada had so far removed the natural obstructions in the great waterways in Canada reaching to the United States, that there was now an unobstructed water route to the Great Lakes for the largest vessels. He described in detail the transportation facilties which had been opened —canals, improved waterways and railroads—by Canada, which are open to the free use of the United States and of American commerce, while the canals of the United States are closed in many material ways to the free use of the Canadian commerce. The speaker said that while the waterways from New York to Ottawa were free and unobstructed the commerce of Canada could not ship to New York without breaking bulk and reshipment on the border. Mr Allen offered a resolution that the transportation problem is of the greatest importance to the western agriculturist, miner and lumberman, and that the completion of the canal system of Canada to a uniform depth of fourteen feet, which can be used on equal terms by both the United States and Canada, justified the request that the use of the inland waters be extended to both countries on equal terms.

BUSINESS continues badly congested at the head of Lake Superior. Large quantities of freight are being driven to the all-rail lines that would ordinarily be carried by the lake and rail route. One of the best posted of the northwestern lake and rail line officials estimates that fully 80,000 net tons of miscellaneous merchandise will be diverted this season to the all-rail route that would, if they were able to take care of it, go to the lake lines. In fact, the situation at the head of the lakes is much the same as prevails during the closing weeks of November. All the adjuncts of freight transportation—boats, cars and warehouses—are short as compared to the business offered. The wheat movement, which is ordinarily the most important of any from the head of the lakes, is this year regarded almost as an incident to the rush of general freight business and the carrying of iron ore.

A WASHINGTON dispatch says that the forthcoming report of the Commissioner of Navigation will contain some significant data of special interest to lake vesselmen. The records show the registrations on the lakes during the past year to have decreased in number while increasing in tonnage. In 1898, 3,256 vessels were registered, having an aggregate tonnage of 1,437,500 tons, while in 1899, 3,162 vessels were registered of a total tonnage of 1,446,348 tons. It is a suggestive fact that at Duluth the registrations increased from 153 vessels of a tonnage of 120,653 in 1898, to 204 vessels of a tonnage of 175,377 in 1899. The increase is said to be due to a more reasonable tonnage tax exacted in Minnesota than in Michigan, a fact to which the falling off in registrations at Detroit, Huron and Superior is also attributed.

THE decadence of shipping by way of the Canadian routes was very vividly recalled by the recent charter of two vessels at Chicago to take corn to Prescott on the St. Lawrence river. These charters were the first since last spring to take grain for export via Montreal and the St. Lawrence river, though this route once did a fair share of the business not only from Chicago, but from all other lake ports. The rate, too, was illustrative of the decadence of the Canadian route. The price was 6 cents or the highest paid in Chicago in fifteen years. It was 2½ cents over the Lake Erie rate, as against 1¼ as the ordinary difference between Ontario and Erie ports when shipping to the former was more of an ordinary occurence.

## EFFECT OF WIND ON STEAMERS.

The influence of wind on the speed of steamers is of considerable more importance than is generally believed. In the Annalen der Hydrographie for January, 1899, L. E. Dinklage describes some observations recently made on two of the North German Lloyd steamers of about 5,000 tons and fifteen or sixteen knots. The results show that when the wind was favorable no difference whatever could be detected in the speed of the vessels during a light breeze or a heavy gale. But with a beam (cross wind) or head wind a reduction of from three to five knots and a half was produced. The obvious conclusion is that the wind when favorable never helps a fast steamer, but always hinders it when unfavorable. Probably with vessels steaming ten knots or less a favorable gale might increase the speed.

## LAKE FREIGHTS.

The past week iron ore has again shown itself king of the freight situation and it is now known that tonnage has already been secured to carry fifteen to sixteen million tons of ore next season. Of course two-thirds of this will be carried by those directly connected with ore interests, but even say that bottoms to carry over five million tons have been chartered ahead at more than double the opening rates of last season, and the week's transactions loom up quite large. The fixing is quoted at $1.25 from the head of the lakes, $1.15 and $1.10 Marquette and $1.00 from Escanaba to Ohio ports, $1.10 Buffalo. The present rates on ore are firm at $1.75 from Duluth, though $1.85 was paid on a small lot, $1.60 Marquette and $1.35 Escanaba.

Grain rates are firm but there is no advance to report. The going rates at 3½ cents on corn Chicago to Buffalo, and 4¾ cents on wheat from Duluth and 5 cents looked for.

Coal charters from Ohio ports are light at former figures, 90 cents Lake Michigan and 50 cents to the head of the lakes, 70 cents Ft. William. Buffalo and Erie are paying $1.00 on anthracite.

Lumber freights are still at $4.50, but $5.00 has been paid on a few Lake Superior cargoes.

## COASTING LAWS SUSPENDED.

A special from Ottawa says that the Dominion Government has made an important decision in suspending for the remainder of the present season the sections of coasting laws preventing the carriage of freight by American vessels from one Canadian port to another port in the Dominion. About 4,000,000 bushels of wheat lie at Ft. William awaiting shipment to Depot Harbor, and from representations made by gentlemen interested in the grain trade, it is certain that it will be impossible for the Canadian vessel owners to fill the demand for freight vessels. Between 300 and 400 cars of wheat are arriving at Ft. William daily, and the congestion that is imminent would mean serious loss to the Canadian wheat growers if the government had not taken means to prevent it by permitting American vessels to carry grain from Ft. William or Port Arthur to Depot Harbor, Owen Sound or other Canadian ports. Much good will be done the Canadian producer and no injury will inure to the Canadian vessel owners, for every Canadian vessel is now at work carrying its share of the year's great crop.

If the foregoing report is authentic it is quite strange that the Dominion Marine Department has not give it a wider publicity, as it is very important that all vessel owners, brokers and masters should fully understand the terms of the temporary suspension of the Canadian coasting laws.

## LAUNCH OF THE PORTO RICO.

The steel steamer Porto Rico was successfully launched from the yards of the Craig Ship Building Co., Toledo, on Saturday afternoon Oct. 14. The last launched was that of the fine ocean-going steamer Mae taken to New York via. the St. Lawrence river, She was built for Miller, Bull and Knowlton. Her capacity was 2,000 tons gross, and 1,200 tons net, length 263 feet. She had not left the ways until another ocean steamer was in course of construction. She differs from the Mae in that she is a passenger steamer more especially, and will do a coasting trade around the island of Porto Rico. She is the seventy-sixth vessel that the Craigs have built. She is named the Porto Rico, and was built for the Porto Rico Steamship Company. She is 220 feet long, 32 feet beam, and 21 feet depth. She has state rooms for 24 first-class passengers, 36 second-class and fitted to carry 150 steerage passengers.

She has triple-expansion engines, 18, 27 and 45 by 30 inches stroke. Her boilers, two in number, are 11x11½ feet. She will carry 175 pounds of steam.

The Porto Rico will carry passengers and package freight. The company that own the boat (the Porto Rico Steamship Co.) own the steamers San Juan and Ponce, that carry heavy freight from New York to Porto Rico, and the Porto Rico will act as a dispatch boat. She will go 15 knots per hour.

The Porto Rico will not shoot the rapids as did the Mae. she will leave here in a short time, and will go by the recently finished Canadian canal—the Soulanges—to tide water.

The Porto Rico is a more graceful craft than the Mae. Her lines are very fine. She has bilge keels that will keep her steady in heavy water.

The Craig Ship Building Co. has another steel ocean-going boat in process of construction, work on which is being prosecuted as rapidly as possible. She is building for Hawgood & Co., of Cleveland. She will be about the size of the Mae.

## A SUCCESSFUL JOB OF WRECK RAISING.

John Donnelly, Jr., of the Donnelly Salvage and Wrecking Co., Kingston, Ont., has returned from Quebec, where he was successful in placing the steamer Porter safely in Russell's shipyard for repairs. It will be remembered that the Porter was run into and had her stem stove in, the colliding steamer ploughing her way into the Porter right through her keelson. The Porter went down in 45 feet of water near St. Croix, 30 miles west of Quebec. There is a considerable current at this spot and it is greatly increased by changing tides, making wrecking operations very difficult. The tender of the Donnelly Wrecking and Salvage Co. to raise the sunken steamer was accepted, and John Donnelly, Jr., took charge of the expedition. After fitting out at Quebec the wreckers started to work at the Porter. After great difficulty six large chains were placed under the steamer and fastened to timbers spread across the schooner Grantham. Then the steamer was slowly hoisted until her deck was only four inches below the bottom of the schooner. In this way was the wreck towed to Quebec and beached, afterwards being pumped out. Before the work of raising the steamer could be proceeded with a new bulk head had to be built across the portion cut away in the collision. This opening was 16x28 feet and was built up with deals, covered with canvas. The steamer was laden with 300 tons of coal into which had worked about 150 tons of sand from the river bottom. The coal was sold to Quebec parties. The underwriters were represented by Capt. Overton, New York, who was greatly pleased with the success of the wrecking operations. The repairs to the steamer will cost about $10,000. Mr. Donnelly is to be congratulated upon the outcome of his undertaking, especially as he met with many discouragements at the outset.

## THE LAKE LEVELS.

The Buffalo Commercial reminds the great vessel interests of the lakes that the levels will possibly be lower next summer, as a consequence of the deficient rainfall of the present year. The rainfall is over 18 per cent. less than the normal for 1899 in the basin of the Great Lakes.

The Chicago drainage canal is soon to be opened, and there are many who believe that its requirement of 300,000 to 600,000 cubic feet of water per minute from Lake Michigan—which will all be sent down the Illinois and the Mississippi—will permanently lower the lake levels. As the rains have been deficient, a lowering of the levels next year is inevitable, unless we have excessive precipitation between now and May next; and this loweriug will have to be differentiated for that caused by the drainage canal. The Commercial says:

Whatever the effects of the diversion from Lake Michigan on lake levels may be, the effects of a deficient rainfall are marked and indisputable. During the last 60 years the periods of high and low water levels in the Great Lakes have averaged about fifteen years. Records kept in Chicago show that the last high water mark, preceding the present rather high level, was 52 inches above the mean. In 1892 the level of Lake Michigan had fallen to 43 inches below the mean. It is asserted, indeed, that Lake Michigan has shown a fluctuation of 70 inches inside of one year.

As for the levels in 1900, it does not follow they will be low because the present year up to Aug. 1 shows a deficient rainfall. Between that date and next May there may be an excess of rain and snow that will make good the short supply.—Toledo Blade.

## "SOO" POWER CANAL.

The Lake Carriers' Association makes a statement of its attitude on the power canal being built at the "Soo," which puts the matter clearly so far the public interest is concerned. It says in a letter to the power canal management:

"To prevent any wrong impression on the part of those interested in the welfare of the Sault, permit me to say the Lake Carriers' Association is not opposed to the completion and operation of the Sault power canal. The association merely asks that before the canal is used there shall be remedial works constructed that will maintain the Lake Superior levels, avoid a dangerous current at the canal outlet, and maintain the levels in the river below the canal. Remedial works that will insure these results should be constructed and currently maintained under direction of the United States. This is the reasonable position of the Lake Carriers' Association, and it has been cordially accepted and endorsed by the management of the canal company. The canal company clearly admits that the canal must be so constructed and operated that it will in no way endanger lake navigation interests.

This is all very good, but since eminent engineers hold diametrically opposite views on the question of the effect this power waterway and the great drainage canal from Chicago will have upon the lakes, who is to determine the fact afterward, in view of the unexplained varying record of water stages in the history of navigation? To incontrovertibly establish the matter would require years of observation and most elaborate and comprehensive analysis of records of precipitation and drainage. So neither the "Soo" power canal nor the Chicago drainage waterway is likely to be restrained in its draught from the lakes.—Evening Telegraph, West Superior, Wis.

## THEORY OF LUBRICATING OILS.

In a lecture on "The Relations of Physics to the Mechanic Arts," Prof. Abbe stated that Prof. Reynolds was the first to show lubrication is simply a case of the flow of a viscous fluid through a narrow channel. When the journal presses on its bearing, the intermediate space is probably 1-10,000 of an inch in thickness. This space being filled with oil constitutes the thin film that converts the rubbing and bearing of the metals into the sliding and rolling of liquid molecules, like myriads of minute steel friction balls. The results of the difficult researches in molecular physics of Stoker, Kirchoff and Helmholz have thus a direct application to the lubricating action of oils.

## NOTICE TO MARINERS.

LIGHT-HOUSE ESTABLISHMENT,
OFFICE OF THE LIGHT-HOUSE INSPECTOR, 10TH DISTRICT,
BUFFALO, N. Y., Oct. 14th, 1899.

Notice is given that during the continuance of the work of dredging the channel into Presqu'ile Bay, at Erie, Pa., which is now in progress, Erie harbor inner gas buoy No. 8 will be moved 75 feet west of its former position, and that it may be necessary to change the positions of some of the buoys marking that channel, or to remove them altogether, temporarily,

South Bank (outer) spar buoy No. 3, which was carried away some time ago, was replaced Oct. 13, 1899.

By authority of the Light-House Board,

FRANKLIN HANFORD, Commander, U. S. N.,
Inspector 10th L. H. Dist.

BALLARD'S REEF CHANNEL.

U. S. ENGINEER OFFICE,
DETROIT, MICH., Oct. 12, 1899.

The improvement of Ballard's Reef channel, Detroit river, has been completed with a clear depth of 21 feet for a width of 300 feet eastward of the "Grosse Isle south channel range." Deep draft vessels should hereafter use this part of the channel, as the depth there is now from 2½ to 3 feet greater than on the west side of the range.

G. J. LYDECKER,
Lieut.-Colonel, Corps of Engineers.

## SHIPPING AND MARINE JUDICIAL DECISIONS.

(COLLABORATED SPECIALLY FOR THE MARINE RECORD).

Insurance—Provisions of Marine Policy—Simultaneous Insurance.—Under a marine policy which contains a clause which provides "that other insurance on property aforesaid, of date the same day as this instrument shall be deemed simultaneous herewith, and the said company shall not be liable for more than a ratable contribution in the proportion of the sum by them insured, to the aggregate of such simultaneous insurance," two policies issued on different days, but to become operative on the same future day at noon, are not simultaneous, so as to make the insurers only proportionally liable. Carleton et al. vs. China Mut. Ins. Co., 54 N. E. Rep. (Mass.) 559.

Shipping—Injury to Live Stock—Liability.—A special contract was entered into between a steamship company and the shipper of a horse over its line, whereby it was agreed by the company that it should furnish room on the steamship for the horse, and supply it with water on the passage, and by the shipper that the company should be in no manner liable for any accident that should happen to the horse on board the ship by reason of the perils of the sea, sickness, disease, or any other unavoidable cause whatever, and further, that he would at his own expense provide stalls and food during the voyage, and proper grooms to take charge of the horse. During the voyage and between ports, the ship encountered a violent hurricane, and by reason of the rolling and pitching of the ship the horse was thrown from his stall and killed. No negligence on the part of the servants of the company was shown; the death of the horse appearing to have resulted from the violence of the storm, or from the failure to provide grooms and a proper stall. Held, the company is not liable for the death of the horse. New England & S. S. S. Co. vs. Paige, 33 S. E. Rep. (Ga.) 969.

## NOTES.

THE Senate of Finland has appropriated 2,000,000 marks (Finnish) to assist the importation of grain, which is needed by the country owing to the shortage of crops.

ADMIRAL SAMPSON'S generous tribute to the victor of Manila appears in the October Century, under a title of "Admiral Dewey as a National Hero." The name of Dewey is set beside those of Nelson and Farragut, each of these three admirals having rendered a transcendent service to his country. "His career has given a lofty impetus to the young," writes Admiral Sampson, "which will bear fruit in nobler aspiration. He has become one of the most valued possessions which the nation can have—a national hero."

THE Cramp Ship Building Co. employ a comparatively large number of workmen, several thousands. Mr. Charles H. Cramp, the head of that corporation, bears the following testimony to the integrity and skill of the American workman, in his valuable paper on "The First Cost of Ships." "Put the plans and specifications of the average English tramp (steamship) in the hands of an American shipbuilder, and he could not duplicate her. He would build a better vessel, of superior workmanship and neater finish in every respect; for the reason, to put it broadly, that the mechanics who make up an American shipyard organization are trained to a grade of performance which they could not reduce to the standard of tramp construction."

ACCORDING to the St. Petersburg correspondent of the Globe, the ice-breaking steamer Yermak is shortly to take up a more important work than ever. This is to keep the navigation open during the coming winter, not only between St. Petersburg and Cronstadt, a distance of 20 miles, but also as far as Reval and Libau on the Baltic. If the Yermak succeeds in keeping the Gulf of Finland and the Baltic open to navigation, the shipping trade of St. Petersburg will be greatly affected thereby. Hitherto the shipping trade of the capital and Cronstadt has been impossible for about six months every year; during the winter a certain amount of trade is carried on by rail to those Baltic ports which happen to be open to navigation.

IN a paper recently read at Edinburg by Admiral Makaroff of the Russian navy, on "Double Currents in the Bosphorus and Elsewhere," the cause of these reserve currents was stated to be difference salinity. The Black Sea, for example, has half the quantity of salt found in the water of the Mediterranean. The reserve currents at Gibraltar and elsewhere were stated to be due to the same cause. The admiral also suggested that the great civilized nations of the world should undertake jointly an investigation of the temperature of the surface water all over the world. "Russia should take Okotsk Sea, Behring Sea or the Sea of Japan, Black Sea, White Sea, Kara Sea and the Finnish Gulf; England takes the Atlantic, United States takes the Northern Pacific, Germany takes the Indian Ocean, France takes the South Pacific. Sweden and Norway takes the North Sea, the Baltic and Arctic Sea. Every nation should extract the information in regard to the temperature from ships' logbooks, put it in tables and send it to the corresponding nations. In this way we could each year become richer in the knowledge of the temperature of the surface water, and would be enabled to study many details which up to the present time are unknown."

THE wreck of the Scotsman comes at a most inopportune moment for those interested in the Atlantic trade of the Dominion of Canada and who so recently met in conference to consider means to bring pressure upon underwriters to abolish the additional premium now demanded from steamers trading to ports in the Dominion, as against those trading to ports in the United States. The line taken at the conference was that it was the duty of underwriters as patriotic men to refrain from hampering the trade with Canada, etc., by imposing an additional premium which, it was claimed, was not warranted. Underwriters were not present at the conference, though a prominent member of Lloyd's was invited. The conference was, however, given to understand that misplaced sentiment could not be permitted to enter into the question at all; but then if the steps to be taken by the Canadian government for the improved lighting and marking of the St. Lawrence and the Straits of Belle Isle could be shown by future experience to have materially reduced the perils of the voyage, there might then be a prospect of approaching underwriters with some chance of success. The stranding of the Scotsman is a striking illustration of the strength of the underwriters' position.

## TO CONSTRUCT A DAM AT NIAGARA.

A paper was read before the Cleveland Chamber of Commerce on Tuesday night, by George Y. Wisner, Esq., of Detroit, member of the United States Deep Waterways Commission, on the subject of "Lake Levels." The paper deals with a question which is attracting general attention throughout the country. Mr. Wisner stated that the facts as set forth were the result of the investigations of the commission of which he is a member. He advocated, principally, the construction of an enormous dam at Niagara Falls, for the purpose of controlling the depth and levels of Lake Erie and St. Clair and Detroit rivers. He explained, however, that the question was an international one, and that in order to bring about the results desired it would require action on the part of this and the Canadian Governments.

Mr. Wisner's paper was in part as follows :

"A general idea of the climatic and physical conditions of the drainage basin of the Great Lakes, which are the cause of the annual and periodical fluctuations of the water surfaces, is essential to a correct understanding of the effects which these charges of lake levels have upon the connected waterways, and the amount which the extreme fluctuations may be modified without injury to the vested rights of property holders.

"The clearing up of forests and converting of the land into tile-drained farms have greatly modified the volume of flow, and the time required for the run-off from watershed to reach the lake reservoirs.

"In the original condition of the lake region, the water which was months in working its way through swamps and obstructed water courses, under improved conditions, may not be as many days in reaching the lakes, a condition tending to increase the rapidity of a rise from any given rainfall.

"The regulation of the level of any lake implies that the surface must be maintained at or near some fixed stage, to accomplish which the discharge must be so controlled that it will be at all times approximately equal to the difference between the supply of water to the lake and the evaporation from the lake surface. It has been shown, however, that the evaporation from the surfaces of Lakes Huron and Michigan is at times largely in excess of the supply, and therefore it is practically impossible to regulate the levels of those lakes. If actual supply is a negative quantity the level must fall even without any discharge at outlet. It has been found from recent investigation that the fluctuations of those lakes may be decreased, however, about 25 per cent. by backwater from Lakes St. Clair and Erie, by the regulation of the latter lake, without interfering with the volume of storage necessary for the maintenance of the proper volume of flow throught the connecting waterways during dry periods.

"Recent examinations have shown that the bed of the St. Clair river in the rapids just below the outlet of Lake Huron has deepened from erosion about eighteen feet since 1886, and that the level of Lakes Michigan and Huron has been permanently lowered about one foot by the lower slope needed through the increased area of outlet. To raise the present low water level of the lake one foot would practically restore the limit of the low stage existing previous to 1898.

"From a careful study of the levels of Lakes Huron, St. Clair, and Erie, and of the slopes of the connecting rivers for different volumes of flow, it appears that for any given amount that the low water stage of Lake Erie may be raised, that for Lake St. Clair will be raised two-thirds as much, and the low stage for Lake Huron one-third of the increase of elevation given to Lake Erie. In other words, if the level of Lake Erie should be raised three feet, the three feet fall now existing in the Detroit river would be wiped out, and the level of Lake St. Clair would rise until the necessary slope was established to produce the same volume of flow as previous to making the improvement.

"The storage capacity of Lake Superior amounts to 28,000 cubic feet per second annually, for each foot in depth on the lake surface, and in connection with Lakes Huron and Michigan, forms a reservoir system absolutely essential for an adequate continous volume of flow through the St. Mary's, St. Clair, and Detroit rivers. Since the time of the greatest discharge into Lake Huron is that when a large supply is necessary for the maintenance of the level of Lakes Huron and Michigan, it is apparent that any modification of the range of levels of Lake Superior would be an injury to the entire waterway system, and, therefore, the natural conditions on that lake should be maintained.

"The average annual supply of water to Lake Erie (not including loss from evaporation) amounts to a volume about 28 feet deep over its entire area, and, since the annual evaporation does not exceed 2.6 feet in depth on the lake, it is evident that a sufficient positive inflow always exists to allow the levels to be maintained at a fixed stage without materially affecting the volume of discharge from the lake.

"The change of outflow which would be produced by regulation would accelerate the discharge during the first six months each year, by an amount equivalent to the annual storage of the lake, and diminish the outflow a similar amount during the last half of each year. This modification will not affect the total annual discharge of Niagara river, and will amount to an increase of only 5 per cent. of the annual discharge during the first half of each year, and a decrease of a similar amount during the last half. This modification will produce no measurable change in the levels of Lake Ontario.

"It may be safely stated that a proper regulation of the level of Lake Erie will produce no injurious effect on the waterways of Lake Ontario and St. Lawrence river, and that such an improvement will increase the depth at low water on Lake St. Clair two feet, and on Lakes Huron and Michigan about one foot. The question to be decided is, therefore, can the level of Lake Erie be controlled at an elevation near its high water stage, and thus improve the low water depths about three feet, and insure a constant depth of channel for the entire season of navigation.

"Observations have recently been made from which, in connection with the record of the water levels of the lake, the discharge of Niagara river has been computed for every month of each year since 1865, and the actual supply to the lake for each month for the same period.

"When the lake is at its highest stage, the outflow is practically equal to the maximum supply, and, if such maximum inflow should continue constant for any length of time, a practical state of regulation would exist, that is, with inflow and dischage equal the stage must necessarily remain constant. If, therefore, such works be placed in the foot of the lake that when the supply commences to decrease the outflow will be correspondingly diminished, the level of the lake will remain constant except as affected by winds. In order to obtain such control of the lake level, it will be necessary to construct a fixed dam in connection with a system of sluice gates, such that when the gates are closed the low water discharge will pass over the crest of the dam, and, when the gates are all open, the maximum supply to the lake will pass through the works. For all intermediate volumes of supply, it is evident that the proper control would be obtained by closing the requisite number of gates.

"The stage of the lake at which the level should be controlled is a matter of international consideration, and must have the approval of the Canadian government before the works can be constructed. While under existing conditions the elevation at which the level would have to be controlled is that of the high water stage of the lake, the regulation can be effected at any lower stage deemed advisable by simply increasing the cross-section of the gorge at the head of the Niagara river sufficiently to produce a corresponding lowering of the water below the works for the maximum outflow, similar to that which has occurred at the outlet of Lake Huron, where the natural deepening of the channel has permanently lowered the lake level about one foot. The natural conditions at the outlet of the lake are such that any necessary enlargement can be made at reasonable cost, and the stage at which the level of the lake should be controlled fixed at any elevation deemed desirable by the United States and Canada. If the adopted stage for regulation be lower than the ordinary high water of the lake, no damage to property rights could arise, and the usual low water depth during the latter part of the season of navigation, when the heaviest traffic on the lake occurs, would be improved about 3 feet.

"The benefits to be derived from the increased depth of harbors and channels of Lake Erie and through the Detroit and St. Clair rivers will be many times the amount that the regulating works will cost. A channel 600 feet wide through the waterway from Lake Huron to Lake Erie will soon be an absolute necessity to safely accommodate the rapidly increasing commerce of the lakes. The difference in the amount of money needed to construct such a channel under the existing conditions, or with the level of Lake Erie regulated, would be more than sufficient to build the controlling works at the foot of the lake. The improvement obtained would be permanent, which cannot be said of the results obtained by present methods, by which the enlarging and deepening of any section of the river channels produce a lowering of the water levels.

## SOCIETY OF NAVAL ARCHITECTS AND MARINE ENGINEERS.

The seventh general meeting of the Society of Naval Architects and Marine Engineers will take place in New York City, at 10:00 a. m. Thursday, Nov. 16, 1899. Through the courtesy of the president and the managers of the American Society of Mechanical Engineers, the meetings will be held in the auditorium of No. 12 West 31st street, the sessions continuing through Thursday and Friday, November 16th and 17th.

The list of papers to be read at this meeting are as follows:

1. Coaling Vessels at Sea, by Spencer Miller, Esq., associate.
2. Causes for the Adoption of Water-tube Boilers in the U. S. Navy, by Engineer-in-Chief Geo. W. Melville, U. S. N., vice president.
3. Suggestions as to Improved Appliances for Launching Ship's Boats, by John Hyslop, Esq.
4. The Electric Plants of the Battleships Kearsarge and Kentucky, by Naval Constructor J. J. Woodward, U. S. N., member.
5. The Increasing Complications in Warships, and How Simpler Arrangements might be Adopted, by George W. Dickie, Esq., member of council.
6. Beam Formulæ Applied to a Vertically Stiffened Bulkhead, with Some Results, by H. F. Norton, Esq., member.
7. Notes on Sheathing the U. S. S. Chesapeake, by Naval Constructor Lloyd Bankson, U. S. N., member.
8. System of Work in a Great Lake Shipyard, by W. I. Babcock, Esq., member.
9. Overhead Cranes, Staging and Riveter Carrying Appliances in the Shipyard, by James Dickie, Esq., member.
10. Designs for the Denver Class Sheathed Protected Cruisers, by Chief Constructor Philip Hichborn, U. S. N., vice president.
11. Novelties in Ship Fittings, by Assistant Naval Constructor R. M. Watt, U. S. N., member.
12. Progressive Speed Trials of the U. S. S. Manning, by Prof. C. H. Peabody, member of council.
13. Tactical Considerations Involved in Torpedo-Boat Design, by Lieut. A. P. Niblack, U. S. N., associate.
14. On the Action of the Rudder, with Special Reference to the motion of the Ship while the Helm is being put Over, by Prof. Wm. F. Durand, member of council.

## EASTERN FREIGHTS.

Messrs. Funch, Edye & Co., New York, report the Eastern freight market as follows :

Since our last report the excitement in the British freight market has culminated under certainty of an early war in South Africa, and owners' demands for their tonnage have undergone a further advance in consequence. Prompt grain boats have been enabled to secure slightly better figures, both for large tonnage to picked port and vessels suitable for Cork f. o., the former advancing from Range to 3s. 4½d., the latter to 3s. 10½d., only two boa's being placed at 4s. by the aid of Danish options. For later commitments owners are generally withholding their tonnage from the market, and although, in view of our large maize crop, prospects are favorable to active chartering for later months loading, very few trades could be closed on that account. Time charterers, and stress of necessity, have been compelled to accept tonnage at considerable increased figures; but this business has been restricted to special trades for which charterers were committed, the freight current here for general business by no means warranted such advance. The Atlantic cotton ports in some cases have sought relief from former charters by rechartering at considerable pecuniary sacrifice; the Gulf ports appear to be doing somewhat better, by reason of the advance established in grain freights, under which charterers could be worked off thence without heavy losses. The demand for timber from the Gulf is light, and the same may be said in respect to general trades.

Sail tonnage remains in the same firm position as of late, and we have absolutely nothing of importance to state. Business has naturally been confined to a few charterers, as reported below, the differenee in views as between owners and shippers being too great to be easily overcome.

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ANOTHER craft to go into the southern lumber trade is the lake steamer George R. Farwell, which has been sold to the J. C. Miner Cypress Lumber Co., in Florida. If she can be made to hold together around Hatteras she will make money in the trade at the present going rates.—The Day, New London, Conn.

## THE WORLD'S CANALS.

The recent Treasury report on the business done by the great canals of the world proves that however much the usefulness of the inland canal may be called in question, that of the international canals is beyond discussion. In this report by the bureau of statistics five canals and Detroit river are considered, to wit: the Suez, Kaiser Wilhelm, St. Mary's Falls, Welland and New York (Erie) canals. The Suez canal, opened in 1868, had a tonnage in its first year of 6,576 tons; of over 1,000,000 tons in 1870; which increased rapidly to a maximum of 8,698,777 tons in 1891, since when there has been little variation in the tonnage. The Kaiser Wilhelm canal, opened but three years, had for the year ending March 31, 1898, 2,469,795 tons, or more than 50 per cent. increase over the first year. The Detroit river tonnage has increased steadily from 20,235,249 gross tons in 1880 to 27,900,520 in 1896 (excepting 1892, when the phenomenal total of 28,553,819 tons were recorded.) But, perhaps the most remarkable showing of all is made by St. Mary's Falls canal, connecting Lake Superior with the lower lakes, the total of 1,734,890 gross tons in 1880 having increased to 18,982,755 net tons in 1897. The freight carried by the Welland canal has not increased in like proportion. Indeed, the totals given show a quite erratic movement of freight through that canal, although the total for 1897 (1,279,987 tons) was the greatest since 1880 (819,934 tons).

The tonnage carried by the Erie canal has declined steadily since 1880, for obvious reasons. The influence of this and other canals on freight rates on grain, flour, etc., from the farms of the West to Atlantic tidewater, however, is the most valuable feature of this report, the tables on which a material reduction in rates between Chicago and New York, whether the freights be carried by lake-and-rail, lake-and-canals, or by all-rail, though the reduction carried by all-water route of lake and canals is greater than in cases where a part of all of the transportation is by rail. The average rates per bushel for wheat from Chicago to New York by lake and canal were, in 1877, 11.24 cents per bushel; in 1887, 8.5 cents, and in 1897, 4.25 cents. In the combination of lake-and-rail freights the rates fell from 15.8 cents per bushel in 1877, to 12 cents in 1887, and 7.37 cents in 1897, while the all-rail rates fell from 20.3 cents per bushel in 1877, to 15.74 cents in 1887, and 12.32 cents in 1897.

## OFFICERS SHOULD TAKE AN INTEREST.

It is not often that a Board of Trade inquiry court brings to light such all-round loose navigation as was shown on the Merrimac, which went ashore near the East Cape of Anticosti, Gulf of St. Lawrence. The stranding occurred during a dense fog, through which the ship was practically run at full speed. The maximum speed of the Merrimac is given at 13 knots, and yet in the 5 hours 25 minutes preceding her stranding she traveled no less than 68 miles. In view of this, the court found that the vessel was not slowed down as per the evidence of log-book and witnesses. The master, too, was confident as to the position of his vessel, and held, in quite the old, old style, that the soundings he took confirmed his assumed position. Naturally, therefore, he was found in default, and his certificate was suspended for three months. But to give the master his due, he does not appear to have derived much assistance from his officers. The court found that the mate's log-book was very carelessly kept. It was not such as would be useful for either party in solving a question, the dead-reckoning only being stated at intervals, and in the case of the stranding no mention at all of the ship being slowed until she was actually ashore. It was also found that the second officer was wanting in discretion in not immediately shouting to the master on the bridge, to go astern immediately, and not waiting until the lead was hove up, and then going to the captain himself—which he admitted occupied three minutes—as in the meantime the stranding might have been avoided. For this failure to intelligently assist in the navigation of the ship, the second officer was very deservedly censured. This holder of a master's certificate never consulted the chart after the vessel entered the Gulf of St. Lawrence, nor did he discuss the courses laid down with the captain, or in fact, take any more intelligent interest in the navigation of the ship that might be expected from a stokehold hand. Clearly, some officers are about as much use to their captains as would be so many dummies dressed in uniform.—The Syren and Shipping, London.

The British government has prepared a report on the losses sustained by the merchant marine of the world during the year of 1898. The total number of vessels lost during the year was 1,141, with a tonnage of 820,725. Of these vessels 322 were steamers with a tonnage of 463,241. So far as causes could be ascertained 524 of the ves el, with a tonnage of 356,503, were lost by wreck. Ninety vessels, with a tonnage of 73,204, were lost in collisions, 48 being steamers and 41 sailing vessels. Ninety-six vessels of 62,752 tons, of which 85 were sailing vessels, were abandoned at sea, and about an equal number of sailing ships and steamers were burned. Twenty-four steamers and 79 sailing vessels left ports and were never heard from, the total tonnage represented being 72,773. The aggregate loss exceeds the average of the preceding 7 years by 25 vessels of 106,706 tons. Great Britain suffered the lowest rate of loss, her percentage being 2.23; the next on the list was Germany with 2.33 per cent.; the United States, fifth, with 4.14 per cent.

## A DEPARTMENT OF COMMERCE AND MANUFACTURES.

A press dispatch announces that President McKinley favors the establishment of a Department of Commerce and Manufactures, its head to be a cabinet officer. This subject is now being agitated somewhat, and we believe the establishment of such a department would be a good thing. About ten years ago we suggested the establishment of a Department of Manufactures, and expressed our belief that its head should not only be a cabinet officer, but that he should have actual supervision of manufacturing operations carried on by the Government and should attend to all contracts with manufacturers. We still hold to that belief. We think that such a department should be in charge of a man experienced in conducting a manufacturing business, and that all arms manufacturing shops, gun factories and industrial establishments of all kinds owned by the Government should be under the care of that department. We believe such a department could, if properly organized, do all the mechanical work now done separately by the Navy, War and Treasury Departments, and could carry on the work to much better advantage. We are convinced that it is nonsense to say that shoulder guns must be made by soldiers, battleships by sailors and mail-bags and postage stamps by postmasters. All these things are purely manufacturing operations, and should be carried on by or under the supervision of a department organized for that purpose. It is proper for our soldiers to specify what kind of a gun they want, or what its requirements must be; it is proper for naval men to specify what kind of vessels and armament they require, or what purpose they must serve and tests withstand, but beyond that the actual construction should be left to a department making a specialty of construction work.

We are aware that there is no precedent for this, and that European governments do not arrange things in that way, but we do a good many other things differently from what they do them, and here where we justly pride ourselves so much on our skill as mechanicians and constructors, there is no reason that is readily apparent why it would not be peculiarly appropriate for us to introduce this further innovation.

There would, of course, be strenuous opposition to it, especially within army and navy circles, but as a result of considerable reflection on the matter, we are convinced that it would be a decided improvement over the present system of having each department of the government manufacture to meet its own requirements. The change would put the government more nearly in line with the plan followed by private enterprise, and would remove many of the obstacles, which now prevent government arms shops, navy yards, etc., from producing work as efficiently as private establishments do it.—American Machinist, New York.

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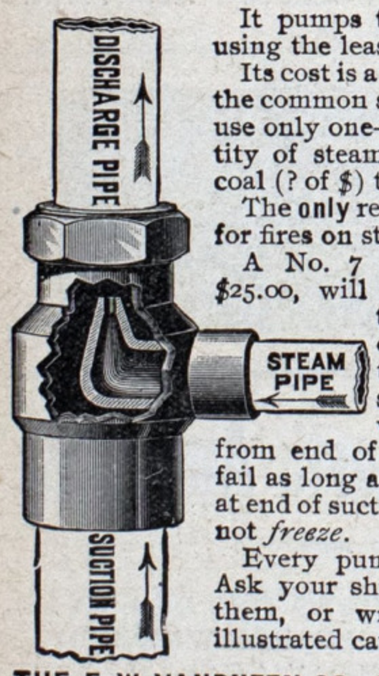


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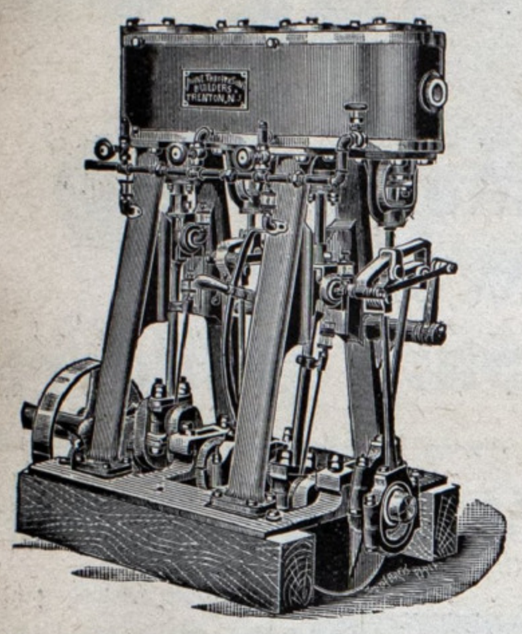

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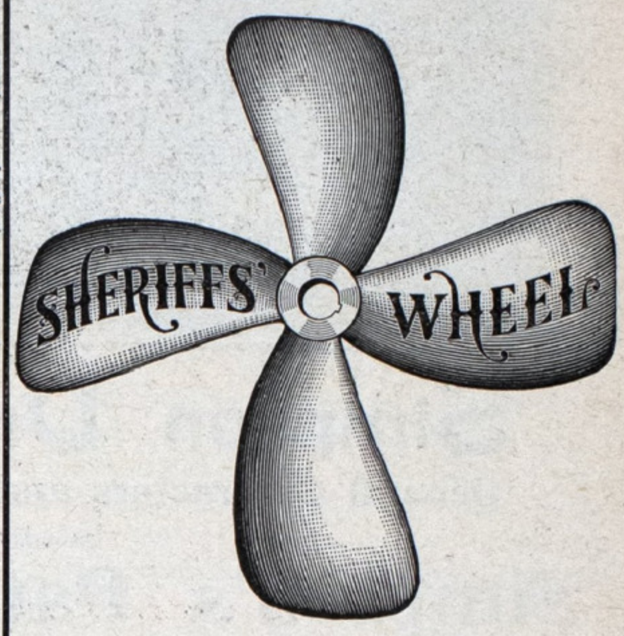


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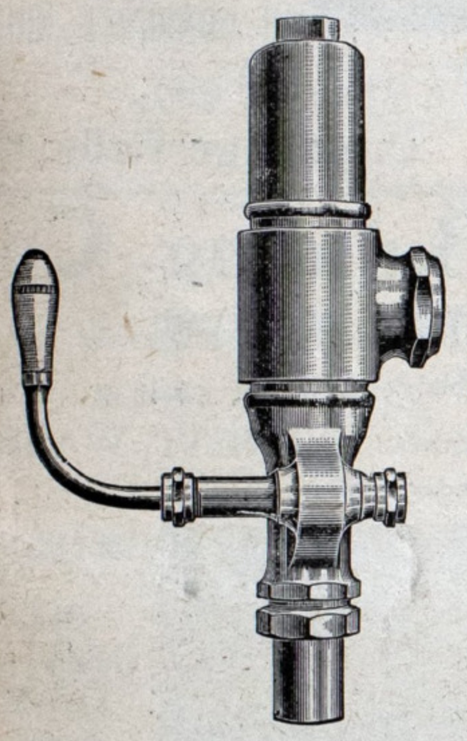

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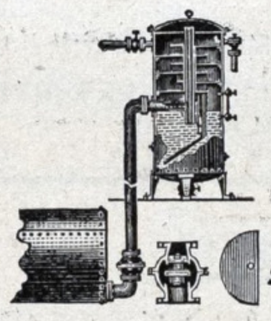

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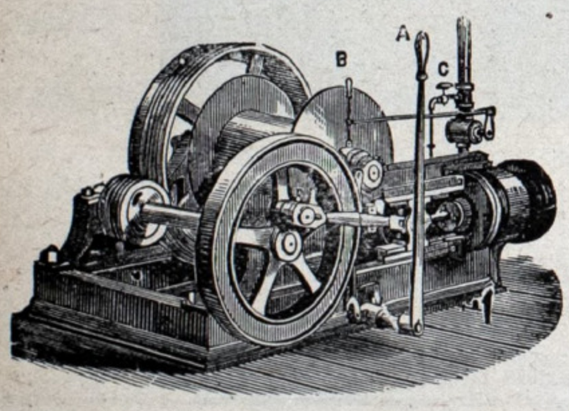


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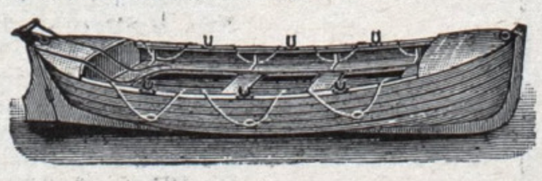

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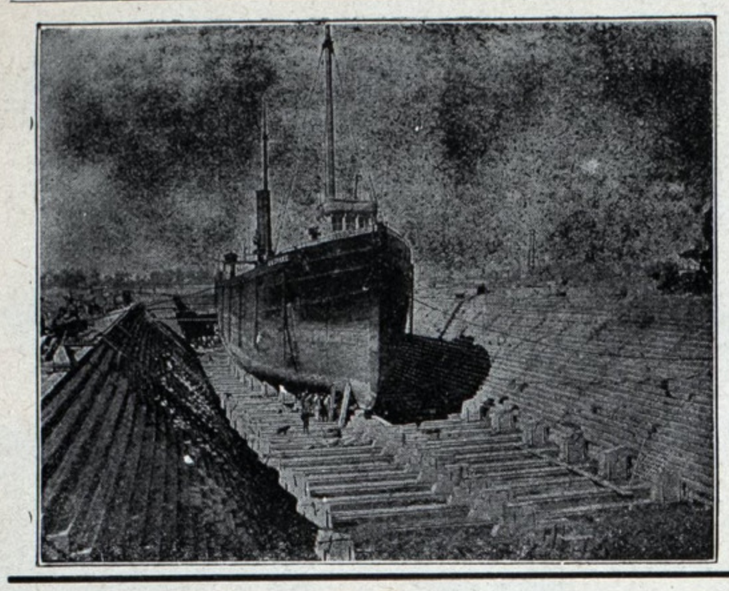

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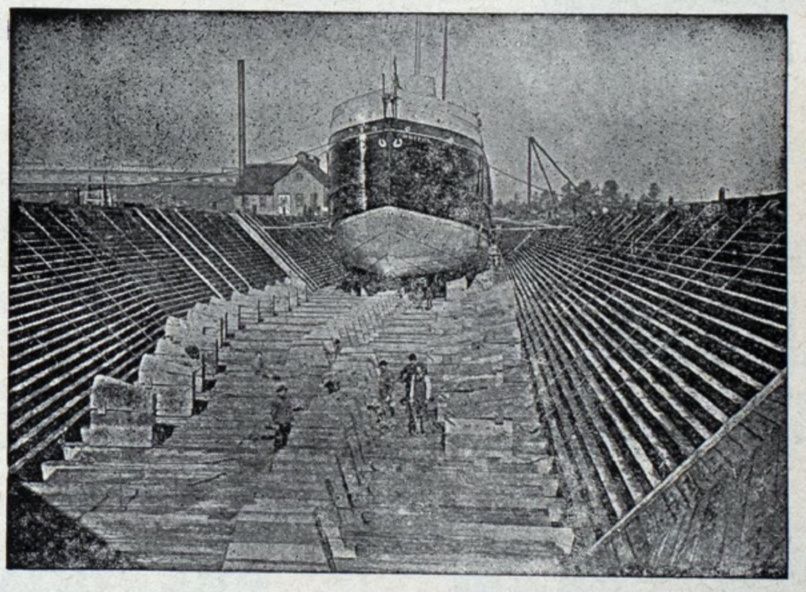

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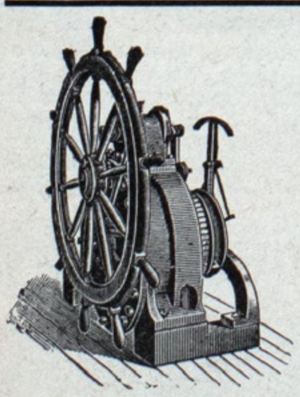

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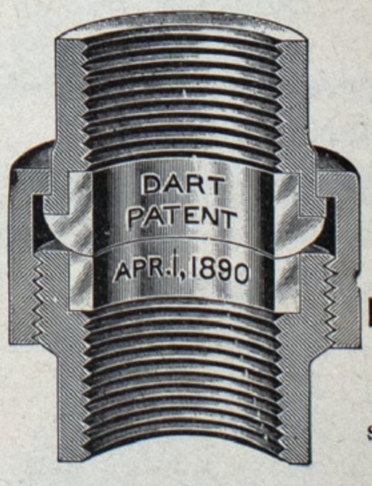


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